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ARCHEOLOGICAL EXCAVATIONS IN THE LLAVES AREA
SANTA FE NATIONAL FOREST, NEW MEXICO, 1972-1974

PART I - ARCHITECTURE

By
Herbert W. Dick

With
Appendix
Deviance in the Gallina: A Report
on a Small Series of Gallina
Human Skeleton Remains

By
James E. Chase

Archeological Report No. 13

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The following personnel were active in the researches:

1972--

Eric Davies, Supervisor
Philip Early, Supervisor
Roderick MacLennon, Supervisor

Gerald Morton, Supervisor
Michael Iski, Survey

1973--

Marilyn Armagast, Supervisor
Ernest Blumenthal, Advisor
Capt. Gary Burrows, Radio
Marie Burrows, Photography
Catherine Howe, Supervisor
Gerald Morton, Supervisor

Jermain Mueller, Supervisor
Lewis Olsen, Laboratory
Carmie Toulouse, Instructor
Charles Vigil, Supervisor
Col. Sam West, Photographer

1974--

Marilyn Armagast, Supervisor
Ernest Blumenthal, Advisor
Capt. James Chase, Supervisor
Physical Anthropology
James Divney, Supervisor
Jean Jachlewski, Surveyor

Theresa Knudsen, Supervisor
Andrew Mason, Supervisor
Philip Rowley, Radio
Pamela Warner, Laboratory
Col. Sam West, Photography
Gene Smith, Supervisor

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INTRODUCTION

Abstract

This preliminary report deals with structures belonging to the Gallina culture excavated in the Llaves area, north-central New Mexico, during the summers of 1972, 1973, and 1974. Under preparation are reports on the site survey, artifacts, and other attributes of the culture. Three hundred and twenty (320) sites have been mapped.

Excavation data in this report includes eight surface houses and five pit houses, most located in a village(s) on Huerfano Mesa. Five pit houses and one double-room surface house remain to be excavated. The main objective is to excavate all structures on the mesa to establish the social structuring and village demography in all its aspects. This will aid in interpreting the survey data.

First Five-Year Plan: Objectives

The present research in the Llaves area is concerned with two main aspects: (1) A complete inventory of every element of Indian construction or observable activity in R. 1 W., T. 26 N., NMPM; and (2) concentrated excavation and interpretation of remains in a geographically limited area in which we conjecture to be components of a village.

The first aspect is concerned with recording on standard Forest Service forms and the placements of site locations on topographic maps. Each site is marked with a 2½-inch numbered metal disk tacked to the nearest tree that will not be disturbed for a number of years. The statistics from a detailed survey will allow the testing of social activities in the form of village patterns and possible social boundaries controlled by topography. There is little doubt the Gallina people had a social structure unlike many Pueblo Indians. It is necessary to point out that in other areas in the time between A.D. 800 and A.D. 1250, Indians were constructing multi-room pueblos small and large; not so, the Llaves Gallinans with their single-room houses scattered about haphazardly.

The second aspect deals with a series of problems. Why the large intermixture of surface houses and pit houses? What are their relationships? Why are so many burned? To the latter, is the

cause internecine warfare or revenge feuds due to suspected witchcraft threats, surface water control, horticulture land control, or to an accident of historical, unrational mythology concocted in another time and carried to the Llaves area as a time-honored folk behavior of mayhem?

The Tentative Extent of the Gallina Culture

In the northwest sector of the central mountains of New Mexico is an area extending some 70 miles north and south and 40 miles east and west, encompassing 2800 square miles in which the prehistoric culture has been designated Gallina. The designation most often used is Largo-Gallina or Gallina-Largo, an unusual method for culture designation in Southwestern archeology. More research will be necessary to test the validity of the hyphenated term. The Gallina culture is thought to encompass a time span from about A.D. 800 to A.D. 1250. Again this date span needs to be further refined in regard to certain culture attributes of the upper Largo Canyon, upper Gobernador Canyon, and the Gallina River areas.

The Llaves area sites, for which this report is concerned, can be considered a northeastern enclave of the Gallina culture. Whether or not this area constitutes the core Gallina culture or population needs to be more fully analyzed.

At present, we are concerned with the northeast boundaries of the Gallina culture. The north boundary is between El Vado Dam and Llaves, New Mexico; few sites are found north of the southern boundary of the Jicarilla Apache Reservation where New Mexico State Highway 112 crosses the line. The conjectured reason for the lack of sites is the absence of springs and stream water. Further, the area is largely grassland with both an absence of large hills and trees.

The Chama River marks the eastern boundary in this local. The Chama River gorge from El Vado Dam to the confluence of the Gallina River impeded the Gallina people from crossing over to the broad, dry, flat Mesa Vieja on the east side of the gorge. A desirability to settle on such uneconomical territory as Mesa Vieja was as much a deterring factor as was the precipitous gorge. The east side of the Chama-Gallina confluence was probably closed off early by the Tewa Indians moving up the Chama from the Rio Grande and usurping the terraces near the river. For whatever reason, the

Gallina people had little desire to leave their steep-faulted, wooded mountain lands for the flat river bottom terraces. They were high mesa and mountain people. Sites on Golondrina Mesa opposite Mesa Vieja are built on the very edge of the gorge. The southern boundary extends south of Cuba, New Mexico. The southeastern boundary, as it extends toward the Jemez Mountains, is the least known area.

We demark the Llaves area west boundary rather arbitrarily at the top of the Continental Divide. The greater western boundary extends 20 or more miles west in an area of moderately wooded mesas and broad river basins that are inappropriately called canyons. Many sites with Gallina traits but with a distinctive pattern of their own and not entirely like those of the Llaves area are to be found west and northwest in the upper tributaries of the Largo and Gobernador Canyons that flow to the San Juan River. The northwest boundary is almost as ephemeral as the southeast boundary.

Suggested Archeological Regions

To conveniently discuss the Pueblo phases located in Northwestern New Mexico listed as Largo, Gallina, or Largo-Gallina, I have divided the Continental Divide area into six regions for ease in description and which are necessarily based on acumen and convenience at this time rather than a solid body of scientific data.

The regions are: (see map 1)

1. Dulce--All drainages ultimately flow into the San Juan River generally east to west. The principal drainages from north to south are Navajo River, Amargo River, Nutria Ciega Creek, Carracas Canyon, Canyon Bancos and Cabresto Canyon. East-west, the area extends from Continental Divide R. 2 E. to the San Juan River R. 6 E. and from north-south T. 33 N. to T. 30 N. The area is 13 miles by 40 miles, or 620 square miles.

2. Gobernador--All drainages flow into the San Juan River from east to west and include from north to south the following drainages: Manuel Canyon, La Jara Creek, Frances Canyon, Gobernador Canyon, and Carrizo Creek. East-west, the area extends from the Continental Divide from R. 2 W. to R. 7 W., and from north to south from T. 31 N. to T. 26 N., NMPM. This encompasses an area 31 by 32 miles, or 713 square miles.

3. Ojitos--All drainages flow into Canyon Largo from east to west and include from north to south Tapicitoes Creek, Canyon de los Ojitos, Canada Largo, and Upper Canyon Largo proper. East-west the area extends from the Continental Divide from R. 2 W. to R. 7 W., and from north to south from T. 22 N. to T. 27 N., NMPM. This covers an area 33 miles by 30 miles, or 990 square miles.

4. Stinking Lake--This area has very few streams and little occupation. Two inland lakes are Boulder Lake in the north, Stinking Lake in the center, and the manmade El Vado Reservoir on the east edge. A single pit house has been found at El Vado on a basalt terrace overlooking the Chama River. I suspect more exist.

The Chama River is the eastern boundary. The region extends from R. 2 E. to R. 2 W. and from T. 30 N. to T. 26 N., NMPM, and encompasses an area 15 miles by 17 miles, or 255 square miles.

5. Llaves--The principal drainage flowing through this region is the Rio Gallinas and the Canada de los Yeguas, an important tributary of the Gallinas, both draining the central part of the area. The Gallinas flows by a circuitous route into the Chama River to the east. The boundary on the east is the Rio Chama; on the west, the Continental Divide; on the south, the 9000 feet above sea level line of the San Pedro Mountains. The north boundary is the southern boundary of the Jicarilla Apache Indian Reservation.

The region extends from R. 2 E. to R. 2 W. and from T. 22 N. to T. 27 N., NMPM; 25 miles by 18 miles, or 450 square miles.

6. Cuba--The Cuba region is a narrow appendage with the upper Rio Puerco and its short tributaries extending from Regina to the north down to La Ventana to the south. The eastern boundary is the 8000 feet above sea level line of the Sierra Nacimiento in the south and the San Pedro Mountains in the north. The western boundary is the divide between Arroyo San Ysidro and Arroyo Chijuilla.

The region extends from R. 1 E. to R. 4 W. and from T. 18 N. to T. 23 N., NMPM; 25 miles by 10 miles, or 250 square miles.

The six regions total 3,278 square miles, or 2,097,920 relatively waterless acres. The major concentration of ruins is in the Ojitos and Llaves regions, an area of 1,440 miles.

The physiography of the western regions, Gobernador, Ojitos and Cuba, consists of mesas and steep canyons that widen out into small valleys in the northern half; but mesas are less steep and high with very broad valleys in the southern half. In general, the elevation increases from south to north from 7,000 to 7,600 feet. Pinyon and juniper trees grow everywhere except in the bottoms of the valleys. On the highest mesas, one finds Western Yellow pine and Douglas fir.

On the whole, the eastern regions, Stinking Lake and Llaves, are much more broken. The area contains long north-south fault directed ridges with east-facing vertical cliffs and steep but traversable west slopes. The elevations change quickly from 7,000 feet in the valleys to 8,600 feet in the mountains. The highest elevations of the five regions occur in the eastern Llaves region and are from north to south Gallina Peak, 8,977 feet; Gallina Mountain, 8,844 feet; and Dead Man's Peak, 8,720 feet. The major timber growth is Western Yellow pine, some Douglas fir and scrub oak. The valleys are covered with sage brush as a climax cover.

TABLE 1
CHRONOLOGY OF ARCHEOLOGICAL STUDIES

RESEARCHER	AREA AND DATE OF RESEARCH	TITLE AND DATE OF PUBLICATION
Cope	Central Llaves Region, 1874	Explorations of the Wheeler Survey (1879)
Douglass	Central Llaves Region, 1916?	The Land of the Small House People (1917)
Hilton	West Gobernador Region, 1917?	Castles of the Chama (1918)
Mera	Gobernador, Ojitos, Llaves, Cuba Regions, 1932	Ceramic Clues to the Prehistory of North Central New Mexico (1935)
Mera	Central Llaves Region, 1933	Some Aspects of the Largo Cultural Phase, Northern New Mexico (January 1938)
Robinson & Warren	Llaves Region, 1935-1955	Tree-Ring Dates from New Mexico, C-D Northern Rio Grande Area (1971)
Hibben	Central Llaves Region, 1937	The Gallina Phase (October 1938)
Blumenthal	Central Llaves Region, 1937, 1939	An Introduction to Gallina Archaeology (1940)
Lange	Northwest Ojitos, Central Llaves Regions, 1937-1939	A Brief Summary of a Cranial Series from North Central New Mexico (1940)
Hibben	Central Llaves Region, 1937, 1940	The Gallina Phase of Central New Mexico (1940)
Hibben	Llaves Region, 1937-1940	The Mystery of the Stone Towers (1944)
Gallenkamp	Llaves Region, 1937-1940	New Mexico's Vanished Tower Dwellers (1953)

TABLE 1 (Continued)

RESEARCHER	AREA AND DATE OF RESEARCH	TITLE AND DATE OF PUBLICATION
Lange	Central Llaves Region, 1941	The Evans Site: A Contribution to the Archaeology of the Gallina Region, Northern New Mexico (1941)
Lange	Central Llaves, 1941	The Evans Site and the Archaeology of the Gallina Region of New Mexico (1956)
Lange	Central Llaves Region, 1941	Tiponi, or Corn Goddess Symbols (1944)
Hall	Central Gobernador Region, 1941	Early Stockaded Settlements in the Gobernador New Mexico (1944)
Hibben	Llaves Region, 1937-1947	The Gallina Architectural Forms (1948)
Hibben	Llaves Region, 1937-1948	The Pottery of the Gallina Complex (1949)
Bahti	Northern Llaves Region, 1947-1948	A Largo-Gallina Pit House and Two Surface Structures (1949)
Schulman	Northern Llaves Region, 1948	A Gallina Cliff House (1949)
Pendleton	Llaves Region, 1947-1948	The Gallina Phase of Northern New Mexico (1952)
Green	North Llaves Region, 1947-1949	The Hormigas Site of the Largo-Gallina Phase (1962)
Green	North Llaves Region, 1949	The Carricito Community (1964)
Green	North Cuba Region, 1950	A Pit House of the Gallina Phase (1956)

TABLE 1 (Continued)

RESEARCHER	AREA AND DATE OF RESEARCH	TITLE AND DATE OF PUBLICATION
Kleindienst	Ojitos, Llaves Regions, 1954-1955	Gallina Phase Cliffhouses: A Report on Excavations in North-Central New Mexico in 1954 and 1955 (1956)
Green, et al.	Llaves, Ojitos Regions, 1955	Raise Floors, Storage Structures, Terracing and Burials in the Largo-Gallina Phase (Manuscript, no date)
Rook and Black	Ojitos Region, 1955	Report of Excavation of Bg 88T, Manuscript, University of New Mexico, Summer Field Session, (1955)
Brody & Lindsey	West Central Ojitos Region, 1955	Report of Excavation at Bg 92 (1955)
Green, et al.	West Central Ojitos Region, 1955	Interpretation of Bg 91: A Specialized Largo-Gallina Surface Structure (1958)
Peckham	Dulce Region, 1955	Excavations at La 3506 and La 3562 (1963)
Wilkinson	Llaves, Ojitos, Gobernador Regions, 1932-1958	Arts and Crafts of the Gallina Culture (1958)
Hammack	South Cuba Region, 1965	The Lagunitas Highway Salvage Project (1965?)
Mohr & Sample	Ojitos Region, 1972	Archaeological Excavations at Site No. 1/102, Rio Arriba County, New Mexico (1972)

GALLINA POTPOURRI

Discovery

E. D. Cope (1879, pp. 352-61) described a series of stone houses on top of a ridge on which he named as a town "Cristone." He remarked that a staircase of stones was present. He further noted the remoteness of water to the site. F. C. Hibben (1940) identifies Cope's village as being on Porcupine Ridge between the towns of Gallina and Costilla. Cope's remarks are also quoted in Hewett (1906, pp. 41-44).

Survey

W. B. Douglass (1917, pp. 3-23) recorded the following categories of sites in his survey: pit houses 80; towers 42, round 21, square 21; shelter houses (cliff houses) 5; small houses 51; houses of several rooms 10; two-room houses; shrines; stair set gardens; trails, stairs; a possible dam on Mesa Golondrina. Douglass (Ibid, p. 8) makes a distinction between towers and houses; the towers consist of a great mass of debris, thick walls and considerable height. Although Douglass did no excavation, he discusses, in general, some artifacts. The pottery he notes increased in quantity and quality from east to west (Douglass 1917, Ibid, p. 17). Surface structures were usually accompanied by pit houses (Ibid, p. 8).

Douglass was a remarkably versatile surveyor who, prior to his Llaves region mapping, was responsible for the establishment of the Navajo National Monument on March 20, 1909. In the spring of 1909, Douglass, with Dr. Byron Cummings and John Wetherill with their Paiute Indian guides, Nasja, Nasja Begay and Jim Mike, found Rainbow Bridge (Schere 1973, pp. 14-19).

H. P. Mera (1935, p. 8-11, map No. 2) drew the following conclusions from his survey and preliminary excavations: (1) The motivating impulse for the culture of the area was derived from Chaco I settlements of the San Juan area; (2) the conical bottom utility vessels, application of fillets, the absence of pottery slipping and some architectural features are aberrant and that some of these may have been derived from a non-Pueblo source (Ibid, p. 8). Under closer scrutiny and with the experience of more extensive researches in the items of the Mera list, only the conical vessel is probably aberrant.

Mera (Ibid, p. 9) noted some of the decorated pottery contained Mesa Verde decorative elements. He stressed the great rarity of intrusive pottery. He further noted that the protective location of the sites indicated war-like activities; culture drift was south into the upper Rio Puerco, and the eastern boundary was the Chama River (Ibid, p. 11).

Excavation

Mera (1938, pp. 236-42), in August 1937, presented a paper at the Denver meeting of the American Association for the Advancement of Science in which he formally recognized a Pueblo cultural complex with Woodland-like pottery shapes (pointed bottom culinary vessels) were in use from 1100 to 1350 A.D. and designated the complex "Largo Phase." Mera (1935, ceramic diagram) had earlier designated the Gallina black-on-white with the pointed bottom culinary vessels as the Largo phase embracing both Pueblo II and III periods.

Mera (1938, p. 9) established distinctive traits for his Largo phase which are and have been subsequently enlarged:

1. Elbow pipe with small projecting knobs (feet?)
2. Comb arrow-polisher
3. Tri-notched axe
4. Pointed bottom culinary pottery.

Suggested Phase Revision

Hibben (1938, pp. 131-136) describes the excavation of the Cerrito group, a series of houses on a protective projection overlooking the lower Gallina Canyon in which he excavated five of eight houses.

Hibben (Ibid, p. 131) found it necessary to assign the term "Gallina Phase" to the Cerrito group and states:

Due to the apparent distinctiveness of this complex from those which are in general termed Puebloan, or the sites which have Athabascan connections, it seemed necessary to designate it separately as the "Gallina Phase."

Hibben (Ibid) further speaks to Mera's (1938, p. 236) Largo phase:

Although undoubtedly connected with the Gallina problem, the Largo is on the other side of the Continental Divide from and peripheral to the Gallina country.

Hibben (1938, pp. 135-36) added two new traits to the original Gallina phase list by Mera (1938, p. 9): notched willow leaf-shaped knives and elk-antler wedges or celts. Hibben (1938, p. 135) further mentions the paddle- and anvil-technique in the shaping of Gallina utility vessels.

The phase designations proposed by Mera and Hibben continue to defy complete solution. E. T. Hall's (1944, p. 4) excavations in the Gobernador (Governador) region in 1941 speak to the problem of phase designation Largo vs. Gallina:

Since the two terms are synonymous, the writer has chosen to unite them into one hyphenated term, "Largo-Gallina," and henceforth will use this designation for the cultural horizon found in the Gallina region between A.D. 1106 and A.D. 1254.

The Rosa phase, A.D. 700-950 (Hall 1944, p. 61), represents a logical continuity with the later Largo-Gallina phase. Hall (Ibid, chart III) proposes a gap of 150 years between the Rosa phase and Largo-Gallina phase.

If future research substantiates the phase assignment, it is suggested the 150-year gap between the Rosa phase and Largo-Gallina phase be assigned the designation "Largo phase." Thus, the sequence for the area encompassing the six regions is suggested:

Rosa Phase	A.D. 600-950 \pm	350 years
Largo Phase	A.D. \pm 950-1100 \pm	150 years
Gallina Phase	A.D. \pm 1100-1275 \pm	175 years

Hibben's researches in the Llaves region spanning 3 years' excavation, 1937-1939, involved 18 surface houses, two pit houses, and four salvaged houses. Two other pit houses were sampled for tree-ring specimens (Hibben 1940, pp. 31-46). The thesis manuscript on the results of the above excavations is on file at Harvard University. The manuscript, unfortunately, contains no maps or ruin diagrams, although all are listed in the table of contents. Inquiries concerning this lack has brought no results.

Since Mera's original survey in 1932 and up to 1941, every year was occupied with research in the greater Continental Divide area. There is a research hiatus between 1941 and 1947 as a result, in part, of

World War II. Since 1947, there has been regular activity. On the basis of publication, the University of New Mexico leads with approximately 71.0%, Museum of New Mexico 11.6%, Columbia University 3.3%, general reports without specific institution association 14.1%.

The Pointed Bottom Pot

The general attributes of the Continental Divide area pottery, particularly the Gallina phase ceramics, were first described in Mera's (1935) early survey of the area. The dominating trait, and an aberrant Pueblo form, is the pointed bottom culinary pot best interpreted as a Woodland trait.

Mera (1938, pp. 236-37) asks questions: (1) From where did the Woodland-like form come and when were they introduced? Because of the similarity to Navajo culinary pottery in the same area, he asks: (2) Were the Navajo styles obtained from the peoples of the Largo phase? (3) Did the Athapaskans introduce Woodland-like forms independently?

The problem of the Navajo culinary pottery and its connections with Pueblo culture between A.D. 1100 to 1270 can be reconciled. The Navajo entered the Southwest about A.D. 1500 (Hester 1962, p. 100), some 230 years after the abandonment of the Continental Divide area. Add to this the basic fact that traits acquired by the Navajo after they entered the Southwest are primarily of Pueblo origin (*Ibid*, p. 101).

It can be conjectured that the early Navajo occupying the Continental Divide area found archeological specimens and proceeded to selectively copy them. Pottery caches available can be illustrated. At Chupadero Camp in 1971 we found a Gallina phase pointed bottom vessel buried under an overhang. A group of similar vessels were found cached near the confluence of the Rio Chama and Rio Gallina by others.

Hibben (1949, p. 200) suggests the possibility that a residual Gallina people influenced the incoming Navajo.

Hall (1944, p. 61) ascertained the date limits of pointed bottom style. He established that it does not occur in the Rosa phase of A.D. 700-950. It is well established in the Gallina phase by A.D. 1100. Hall conjectures the trait made its appearance around A.D. 1000.

Hibben (1949, pp. 194-202) added a new dimension to champion the Woodland pottery hypothesis. He ascertained the construction was by coiling and thinning with paddle and anvil (Ibid, p. 197).

The excavations at Cerrito produced six cord-marked sherds which are described as Eastern Colorado Woodland cord-marked (Ibid, pp. 201-02). Lange (1956, pp. 81, 86) describes six cord-marked sherds from the Evans site. In site 29 near Alkali Spring are three sherds that resemble cord-marking but, on close examination, proved to be coarse striations partially smoothed.

Pattison (1968, p. 138) observed that certain sherds found in Nogales cliff house show indentations that may be marks of an anvil but are quite small and may be finger indentations. A single restored pointed bottom pot was thinned at the base with paddle and anvil, but the upper body was only scraped.

Until more evidence is supplied, we can do little more than conjecture that the pointed bottom culinary vessel form is a local regional invention of the Gallina phase, that the "cord-marking" and paddle and anvil techniques have been misidentified or are only minor local experiments.

Physical Anthropology

With recognition of potential Woodland traits in the Gallina phase, researchers began to search the physical remains for evidence of genetic traits that would support the Great Plains intrusion theory.

With the study of 38 skulls from the Gallina phase (A.D. 1100-1275) and all from the Llaves region, Lange (1940, pp. 13-19) concluded that the homogeneity of the group is notable. There was very little differentiation between adult male and female crania; there appears to be an affinity of the Gallina series with physical groups commonly associated with the Plains rather than Southwestern tribes.

Gabel (Hall 1944, pp. 53-59) reports the crania from the Gobernador (Gobernador) region of the Rosa phase (A.D. 700-950) show affinities exist between the Gobernador crania and the Plans types of the Pecos material and so suggested the possibility of a relationship with actual Plains Indians. The comparisons of individual measurements of the Gobernador specimens show a closer relationship with Plains people

than Southwestern people. Gabel (1944, p. 58) further concludes the Gallina phase crania constitute a different morphological type from the Rosa phase Gobernador series. Reed, quoted in Lange (1956, p. 85), states the Gallina phase skulls are quite chacoan, certainly of "Southwestern plateau type" or "Ashwid type."

It would be relevant to compare cranial material from Utah and Western Colorado, particularly the pre-Pueblo people, the Utes, Paiutes, and Navajo with the crania of the Rosa and Gallina phases. That the skeletal material from the Continental Divide area of the Rosa and Gallina phases are Plains forms is as yet undetermined.

Elbow Pipes

Elbow pipes were first recognized by Mera (1938, p. 242). The bowl of the pipe is flaring and bell-shaped, and the elbow is provided with two small projections or legs on the underside. The specimens average about 4 inches in total length (Hibben 1938, p. 135).

The elbow pipe distribution in the sites of the Continental Divide area is spotty. They occur in relatively abundant numbers in the Cerritos site (Hibben 1938, p. 135). On the other hand, we have excavated a dozen structures in the central Llaves region and not found a pipe of any kind. This is true for a number of site excavations. Lange (1956, p. 80) notes most of the diagnostic Gallina phase artifacts were lacking, including the elbow pipe in the Evans site.

Peckham (1963, p. 101) made a most significant discovery relating to elbow pipes in the Dulce region. He found in a late Rosa phase site four tubular cloud blowers and two elbow pipes; one has two "feet" like the Gallina phase examples. The sites are judged to date between A.D. 825-900 (Ibid, p. 94).

The site LA 3221 that produced the elbow pipes contained common Rosa phase pottery, a single Gallina black-on-white sherd, and a number of sherds. An inference can be drawn that the elbow pipe is possibly an invention of the late Rosa phase in the Dulce region and spread southward.

The most northern Gallina phase site thus far recorded is just south of Dulce, New Mexico. This is also the locale of the most eastern Rosa phase site (Peckham 1963, p. 114).

Stockaded Settlements

These are nonexistent for the Gallina phase in the literature. They were first reported by Hall (1944) in the central Gobernador region and are an important trait of Rosa phase (A.D. 700-950) sites.

The stockades may encompass a pit house, a pit house and storage outbuildings, or several pit houses. Dimensions of these stockades range from 82 by 98 feet to 180 by 188 feet. The stockade posts, up to 7 inches in diameter, were spaced at intervals of 4 to 10 inches, reaching an estimated height of 6.5 feet, and they were interlaced with brush. Hall (Ibid, p. 28) interprets the stockade as serving no other purpose but defense.

Perhaps these fences had other purposes such as turkey retaining fences or coyote fences. Hall lists in his Gobernador sites a recovery of 275 bird bones of which 272 were bones of the turkey (Meleagris Gallapavo). The bones showed a great range in size. Other conjectured uses of the fences would be their use as a windbreak, snow fence or to keep out witches. The burning of some stockades could be caused by outdoor hearths, not uncommon in these sites.

Stockades are difficult to find unless some burning has occurred. A stockaded pit house, the first to be found in the Llaves region, occurs near the town of Gallina, excavated under the auspices of the Museum of New Mexico by Tim Seaman.

In the central Cuba region, Hammock (1965, pp. 2-4) excavated a pit house of Rosa phase enclosed by a palisade. The stockade was 85 feet in diameter and burned. The site is tentatively dated between A.D. 850 and 950 and represented the earliest of three houses excavated on the mesa. These are the most southern Continental Divide area sites thus far excavated (Ibid, p. 9).

Towers

The most popular layman's concept of the Gallina phase is the "towers." Each summer, the intrepid tourist explorers stop at our camp and ask directions to the towers, hoping to obtain a photographic record of their existence. Convincing them the ubiquitous mounds of rocks, most of which are houses, are purported towers is no enviable task.

Webster's Seventh New Collegiate Dictionary (1970) definition of a tower is: "A tower is a building or structure typically higher than its diameter and high relative to its surroundings that may stand apart, or be attached to a larger structure."

The title, "Castles of the Chama," by Grace Hilton (1918, pp. 53-55) used in most bibliographies about the Llaves region is somewhat of a misnomer. The "castles" which she describes are located in the western Gobernador region and represent the Pueblitos of the Gobernador phase (A.D. 1696-1775) in the Francis-Gobernador locale (Hester 1963, p. 63; fig. 15, p. 43).

Douglass (1917, p. 5) was first, in his survey in the Llaves region, to identify two principal types of dwellings--circular pits and towers. Towers were identified as buildings notable for the great mass of debris, indicating not only thickness of the walls but considerable height as well (Ibid, p. 8). Other structures listed are small houses and shelter-rock houses (Ibid, p. 12).

Are there structures of the Gallina phase that can be classified as towers? The answer is yes. They are not a common trait. Thus far, three sought-after structures that stand above and apart from other structures of a community have been formally reported. The most definitive example is a double-wall, circular structure, Bg 20 on Rattlesnake Ridge (Hibben 1948, Pendelton 1952, Green 1962); the second is the Hormigas site, also on Rattlesnake Ridge (Green 1962); the third is in the Carricito Community (Green 1964). Three similar structures were found in our survey in the Llaves region, two on Mesa Golondrina, and one at the Chupadero Camp settlement.

The excavated tower structures tend to have these attributes:

1. Most are circular.
2. They are near the center of the community.
3. They exhibited an excess of wall debris in comparison to surrounding buildings.
4. All served as storage units.
5. Those excavated have shown two periods of occupation.

6. They are not placed in a topographic commanding position for observation but, conversely, the nearby houses often are.

7. They do not contain common interior domicile features.

8. Many communities do not have tower-like structures.

The vandalized structure in the Chupadero Camp community displayed all the above characteristics. Two such structures on Mesa Golondrino have the topographic position attributes listed above. The report by Hibben (1944, p. 15) that ". . . 500 of the stone towers . . ." existed in the Llaves region is overstated.

Gallina Phase Archeology: Additional Fact or Fiction?

The first of three popular articles about the Gallina phase was published by Hibben (1944) entitled, "The Mystery of the Stone Towers." The article gained immediate success and created a tower rush of the exploring-minded public. The second article entitled, "New Mexico's Vanished Tower Dwellers," appeared in 1953 (Gallenkamp, pp. 312-19) and utilized much new material but incorporated many of the details of the earlier Hibben article. The third and most recent to appear is by Ceram (1971, pp. 272-78) and is a book chapter entitled, "Intermezzo - The Towers of Silence." This latter work is largely a rewrite of Hibben's 1944 popular article.

Although not fully reported extensively in the scientific literature, a number of provocative traits are reported in the popular literature for the Gallina phase. Hibben (1944, p. 68) describes the material found in banquette bins in one of the sites excavated: buckskin bags full of ceremonial face powder, shell ornaments, painted prayer sticks of wood and feathers, good-luck pieces, buckskin clothing, feather robes, cane arrows, flint, ceremonial masks and horns. In addition, there was a woman bow person described as having the head hair braided into six strands gathered in a bun on the back of the head and red paint placed down the scalp line where the hair was parted. Further, a man was found wearing a buckskin breechclout hanging down from a twisted belt around the waist; another with buckskin breeches decorated with porcupine quilling. In three towers excavated, one contained 16 people; "they were better preserved than many Egyptian mummies," (*Ibid*, p. 68). Another tower contained five defenders, and in still another, 11 bodies (*Ibid*, p. 70). Gallenkamp (1953, p. 319) relates that one unit house ". . . yielded a remarkable number of stone and clay figurines."

THE GALLINA PHASE IN THE LLAVES REGION

Geomorphology and General Ecology of the Llaves Area

The northeast region of the Gallina culture varies from 6500 to 8000 feet above sea level. The land is filled with sharp, tilted sedimentary deposits forming long lines of "hog-back" units trending north and south, precipitous on the east side with less slope to the west. The west side is often dissected with deep canyons that run for a short distance into the valleys between the hog-backs. There are also high, flat-top mesas such as Golondrino and French; also occasional individual mountains such as Gallina Mountain and Dead Man's Peak, all part of the faulting and contortion of the eastern side of the San Juan anticline.

The west sides of ridges are heavily timbered with pinyon, varieties of juniper, scrub oak, ponderosa pine, and some Douglas fir. The mesas and mountains are covered with open pine forests. The lower valleys are covered with sage, much now converted by rippers or plows to fields of foreign grass species such as Crested wheat and Russian rye. Occasional small, private acreages are planted in wheat or oats. Previously, many homesteads in the valleys were devoted to bean farming. All agriculture activities are dependent on soil moisture from winter snow or spring rain, just as it had been for the Indians. It is a "hit or miss" proposition.

Horticulture: Problems

It is conjectured that to understand the rise and decline of the Gallina Pueblo culture, it will require an indepth understanding of ecological conditions between A.D. 800 and 1250. Climax plant distribution was probably very different than it is today, not in species and genera but in amounts and distribution.

The historical "accident" of the Gallina society's social evolution is an anomaly when compared to the "bee hive" social structure of their counterparts in other areas of the Southwest. In this we refer to the multi-room complexes of most Pueblo Indians to the haphazard, single house units of the Gallina people of the same time period. Without a great amount of data, we are working with the assumption that social organization is related to horticulture practices.

The broad valleys, if farmed, were probably covered with dense sage and would have to be burned off. There is evidence of this in the lower Chupadero Arroyo. Other evidence of farming on flats, though meager, is the evidence of field plots demarkated by lines of stones. Unfortunately, these have been seriously disturbed by ripping operations in planting imported grasses.

The thickly wooded areas were probably periodically burned, if not by people, by lightning fires. More detailed information is needed about tree growth in this area after a fire. Many questions arise: How long is it possible to grow corn and beans in a burned area before the small trees multiply making horticulture difficult or impossible? How long is it before the young tree growth can be effectively burned to produce a viable horticulture area? That fire did occur from time to time can be seen in the fill of pit houses, for in them are layers of sage and wood charcoal at various levels, accumulated in post abandonment.

The low rock terraces, which have been frequently mentioned in the literature but not studied in detail, are an obvious method for using sloping terraces as horticulture areas. Water coursing down a gradient would be collected or slowed for beneficent plant use. At present, these are frequently covered with a heavy growth of pinyon, juniper, or pine.

Two instances have been noted where small check dams have been placed in advantageous drainages. More examples of this must be sought.

Weather interpretation in regard to the effect it had on horticulture is an inponderability. The tree rings give indication of variations in ground moisture; but more important to the growth of horticultural plants in this mountainous region is the year-to-year variation of the growing season length. An example is the heavy frost in mid-July of 1971 which killed almost all the garden crops, including corn, in the Gallina area. At present, the Llaves area is a marginal corn growing area. The U. S. Weather Bureau growing season averages are unreliable to describe the effect of climate on a people's food supply.

Water

Potable water, as it exists today, is mostly limited to springs. These are an important consideration in the interpretation of Gallina settlement patterns.

Alkali Spring (NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 3, R. 1 E., T. 25 N., NMPM) is an important water source in an area devoid of good resources. It is the main source for our Huerfano Mesa group .4 mile east. It supplies enough water to dampen the sands of Chupadero Arroyo for a mile. Other springs within a 2-mile radius from Alkali Spring are Chupadero Spring 1.6 miles WNW, Alamo Spring 1.6 miles NNE, Chongo Spring 2.0 miles NNE, Dead Horse Spring 1.6 miles WNW.

The Gallinas River and all other main stream courses in the region, except the permanent Chama River, are ephemeral. Water can be obtained by digging in the sand in many places. There are few sites more than 2 miles from water, but the vertical distance of sites above the water source made water gathering a formidable chore.

Gallina Phase Structures

The majority of the Gallina structures in the Llaves area consists of rectangular surface houses and round pit houses. On occasion, a semi-round surface house or a semi-rectangular pit house will be encountered. Rectangular structures as supplementary buildings for storage, grinding corn, keeping turkeys, or drying corn frequently accompany pit houses, rarely surface houses.

Another category is cliff houses which are surface houses placed under a natural rock overhang. Good rock overhangs are not common in the Llaves area. There are six known cliff house units within a 6-mile radius of Llaves. All have been explored by vandals or archeologists. These vary from a single house to eleven houses (Nogales Cliff Houses). We can refer to these as houses rather than a multi-room singular house. Each house has the characteristic interior of noncliff houses.

A different structure with a special function is anticipated with the observance of two of these excavated by unknown parties in the Llaves area. These are tall circular structures near the center of a group of houses. It is conjectured they might have served as communal granaries. Partitions in the structures could be interpreted as storage bins.

Surface Houses: Composite Description

The majority of the surface houses are single room structures often separated by a considerable distance from each other. They are frequently built on terrain with a commanding view. This, of course,

is by no means universal, for they also occur at the base of hills and even on broad, flat surfaces away from the hills. Still others occur on low ridges which allow no view or protective attributes whatsoever.

The second most numerous components after single surface structures are double house units and occasional triple house units. Lines of rooms with contiguous walls, though rare, are present east of the Continental Divide. The largest of this nature has seven rooms in a straight line.

The Gallina people had a propensity for building bulky, solid, rectangular, surface structures or slabs or angular boulders or sandstone, sometimes using blocks weighing 300 pounds or more in the foundation. For binder, they used mud mortar in varying amounts. Considering their great distance from water, most of the houses, we conjecture, were constructed during the rainy season in spring or summer. The walls vary in thickness from 2 to 6 feet; a thickness of 3 or 4 feet is usual.

Interior Arrangement. One of the most exacting, predictable attributes of the Gallina people is their conservative interior arrangement of house features. The major interior features are oriented north-south. A line placed through the center of the cold air ventilator in the south wall, north through the deflector and hearth, is often only a few degrees from true north. Two partitioned, lateral storage bins attached at right angles to the east and west wall flank the deflector with a small passage between the bin and deflector on either side. It required careful navigation to walk through this narrow zone without rubbing the deflector or bin walls. A narrow alley-way, which we call the anti-room, exists between the bins and the south wall of the house. It is usually unpaved and contains trashy floor debris. Grinding or mealing bins are also sometimes found here.

Banquettes or Wall Benches. The east, north and west walls in the main room north of the partition bins are lined by a banquette or bench 1 or 2 feet in width and 2 or 3 feet high. It is constructed of sandstone slabs or blocks laid with liberal quantities of mud mortar. All sorts of small artifacts are found on their surface. They are usually too narrow to be comfortable sleeping places and too high to be comfortable sitting places. Frequently, bins are placed in the northeast and northwest corners of the bench. Occasionally, bins are placed in other places in the bench.

Main Interior Storage Bins. Two thin-walled bins, built in the southern part of the room, extend at right angles from the bench or the east and west walls and extend toward the air deflector. A narrow space exists between each bin and the deflector, allowing a narrow passage into the anti-room consisting of a small, unpaved area between the south wall and bin walls. Both the east and west bin are partitioned near their centers by a thin wall which encases a small, roof-support post.

The bins vary in height from 3 to 4 feet, 3 to 4 feet in width, and are 4 to 8 feet in length. Occasionally, bin walls contain wooden rebars for additional strength. The bin covers consist of thin, flat, stone slabs. In one house not excavated by us, we noted geometric decorations on the north bin walls. The bin walls are some of the most delicate features of the house.

Most bins have circular ventilating holes near their floors, and most penetrate the north bin walls from the main room. They range from 3 to 5 inches in diameter and are often closed by a clay plug from the outside or by round cobbles forced into the hole. The hole probably served a double purpose, that of airing the stored maize to prevent molding, and to remove the contents without lifting the bin cover.

Vertical Roof Supports. Each house has four vertical roof supports. Two are placed either wholly or partially in the north wall bench. Two posts, smaller in diameter than the north posts, are centered in the main bins in the south part of the house and incorporated in the thin bin partitions. The north posts are usually not more than 1 or 2 feet from the back wall. Their structural importance defies explanation because they are so close to a sturdy bearing wall that could so conveniently carry the two horizontal beams or main roof supports. Except for custom, the two north roof supports seem superfluous. The north posts, 8 to 12 inches in diameter, are consistently larger than the south posts ranging from 4 to 6 inches in diameter. The southern posts, because of their small diameter, might have required the "capital" reported by other excavators. We have found none thus far.

Deflectors. The deflector, usually U-shaped, is south of the hearth and is midway between the main east and west bins. The concave side faces the hearth. The concave side served as pot warmer in which is often found ashes and sometimes a cooking pot. The deflector also served other purposes, that of coursing cool, ventilator

air around the hearth and as a reflective device to deflect the heat into the large living room. Deflectors vary between 1 and 2 feet for all dimensions.

Hearths. Fireplaces vary from shallow to deep and can be round, square, pentagonal or hexagonal. Most are lined with stone slabs and have a slab on the bottom. The top edge at floor level is usually lined with a low, round top, adobe collar. Hearth depths are as much as 2 feet deep and as shallow as 6 inches. The deep hearths are filled with a compact ash for the entire depth, and the fire was maintained in the upper 4 or 5 inches. The pointed bottom cooking vessels were nestled in the ash; support stones in a hearth have not been found.

Walls. The interior house walls were plastered with a thick base coat upon which was placed successive layers of thin adobe plaster, generally sandy and light gray in color. Successive inner layers are often black with soot indicating a plaster coat was applied when the surface became too dingy.

Ventilators. Ventilators extend into the south walls and consist of a horizontal shaft 2 or 3 feet long, and they range from 3 to 4 feet in height and width from which a vertical shaft 6 inches to 1 foot in diameter passes upward through the center of the wall through which air passes into the room. In most cases, a small log 3 or 4 inches in diameter was placed in the wall above the opening of the horizontal tunnel. The roofs were frequently supported with small logs.

Roofs. The roof is a simple affair with poles 3 to 5 inches in diameter placed side by side on two main bearing beams 12 to 14 inches in diameter. Mud 4 to 6 inches thick was placed directly on the poles. Unlike Indian construction in other areas, the Gallina people used no pine needles, willow withes, or brush to first cover the poles before applying the mud cover. The use of stone slabs on the roof vary; some were partially covered and some were not covered.

Floors. The house floors are usually covered with thin slabs of shaley or fine grain sandstone often gathered some distance from the house. Slab sizes vary, some reach a size of 3 feet long and 2 feet wide with smaller sizes used as fillers between the larger slabs. There are a number of examples of partial paving. In some cases where partial paving exists, it is because of the removal and subsequent reuse of slabs from the floor of an abandoned house for the floors or roofs of a newly constructed structure.

Wall Pegs. It is not uncommon to find the remains of two or three small poles embedded in the east and/or west walls 3 or 4 feet above the floor. These were probably used for hanging materials.

Niches. Walls which contain holes, regardless of size, we refer to as niches. Thus far, their purpose is undetermined, although in pit house 3 an awl was found in one of these. Most niches are not more than 2 to 4 inches in diameter and extend 4 to 8 inches into the east and/or west walls. They vary from 2 to 4 feet above the floor. These can be missed if the walls are not carefully searched.

Cists. Sub-floor pits occasionally occur in the floor of houses. These can be circular or rectangular and are usually unlined. These pits have been assigned the term "cist," regardless of size or use. The cists usually range in diameter from 2 to 4 feet and in depth from 1 to 4 feet. One very unusual cist measured in a site (AR-03-10-02-129), not our excavation, was jug-shaped with a mid-diameter of 8 feet and a depth of 7 feet. Cists were used for human burial, storage of ceremonial objects, and for unknown purposes.

Roof Bins. Our excavations in 1973 produced an interesting feature heretofore gone unrecognized. We have recorded this trait in one pit house on Huerfano Mesa and two surface houses on ridges west of the mesa (AR-03-10-02-129, AR-03-10-02-136). The details are present only in burned houses where baked samples are preserved. In pit house 4, above the roof detritus, we found several hundred rectangular chunks of coarsed adobe with pole molds ranging from 2 to 4 inches in diameter. The post molds range from 4 inches to 10 inches apart. The width of the mud between the post molds precludes their being used as a roofing surface; if used as roofing material, a human foot putting weight on these segments would press through the interstices of the abnormally widespread poles. To add credence to the possibility that these remains were roof bin material, we found a large specimen midway up the vertical shaft of a ventilator in a surface house (AR-03-10-02-136) excavated by unknown persons. Thus, we conjecture that the roofs of some houses were fitted with storage bins. It can be argued on the other hand that these represent a parapet along the bearing walls above the roof, but the right angle position of some log molds relative to the vertical molds indicate bin roofing. In the detritus fill of pit house 4, some 300 sections were found in the east half of the house, most above the roof detritus.

Pit Houses: Composite Description

Pit houses occur singly or in clusters of as many as eight. Frequently, pit houses occur in close proximity to surface houses, sometimes as close as 10 feet. Surface outbuildings of stone and mud or poles and mud, with thin walls and often poorly constructed, occur with pit houses in an estimated 30 percent of the units. Pit houses do not occur in areas of severe rocky terrain even though surface houses exist; the reason is obvious.

Although dozens of surface houses have been excavated in a scientific manner, invariably the pit houses often located beside the excavated surface house are left untouched. This unfortunate oversight by excavators has done very little to solve the relationship of pit houses to surface houses, or, for that matter, any meaningful social relationships. To ignore the pit house is to ignore more than half of the potential social attributes of the culture. Pit houses in our survey census outnumber surface houses five to one.

The excavation of a pit house by the Indians required a prodigious amount of work. In most, the diameters range from 18 to 24 feet and their depth 7 to 9 feet. Occasional structures, though rare, measure 45 feet in diameter. To appreciate the labor involved, one can think of excavating a small basement with sharp pointed sticks, antlers and baskets in a tightly compacted shale clay.

From a perusal of the literature and through observation, one pit house has been excavated for every 20 excavated surface houses. We have never seen a vandalized or pot-hunted pit house. The nature of the sediments, a shale clay component in which the pit houses were originally excavated and subsequently filled with the same material, then combined with 500 years of periodic standing water in the filling depression, precludes difficult dirt removal by the archeologist.

When large boulders were encountered by the Indians, which could not be lifted out, they usually chipped away the rock until it conformed to the shape of the wall or floor or chipped it away entirely. Large boulders embedded in the wall often show evidence of heating to facilitate chipping.

Pit houses can be round, oval or rectangular with broad, rounded corners; most are round in shape. The interior features consist of

a ventilator, deflector and hearth on a north-south axis. Two partitioned bins flank the deflector and extend east and west to the walls just as in a surface house. A bench encircles the walls from the east bin to the west bin. Four vertical roof supports are in the same position as in a surface house. In summary, the pit house features, with only minor differences, duplicate those of the surface house. The bench is carved out of native soil. The ventilator is usually furnished with timber supports.

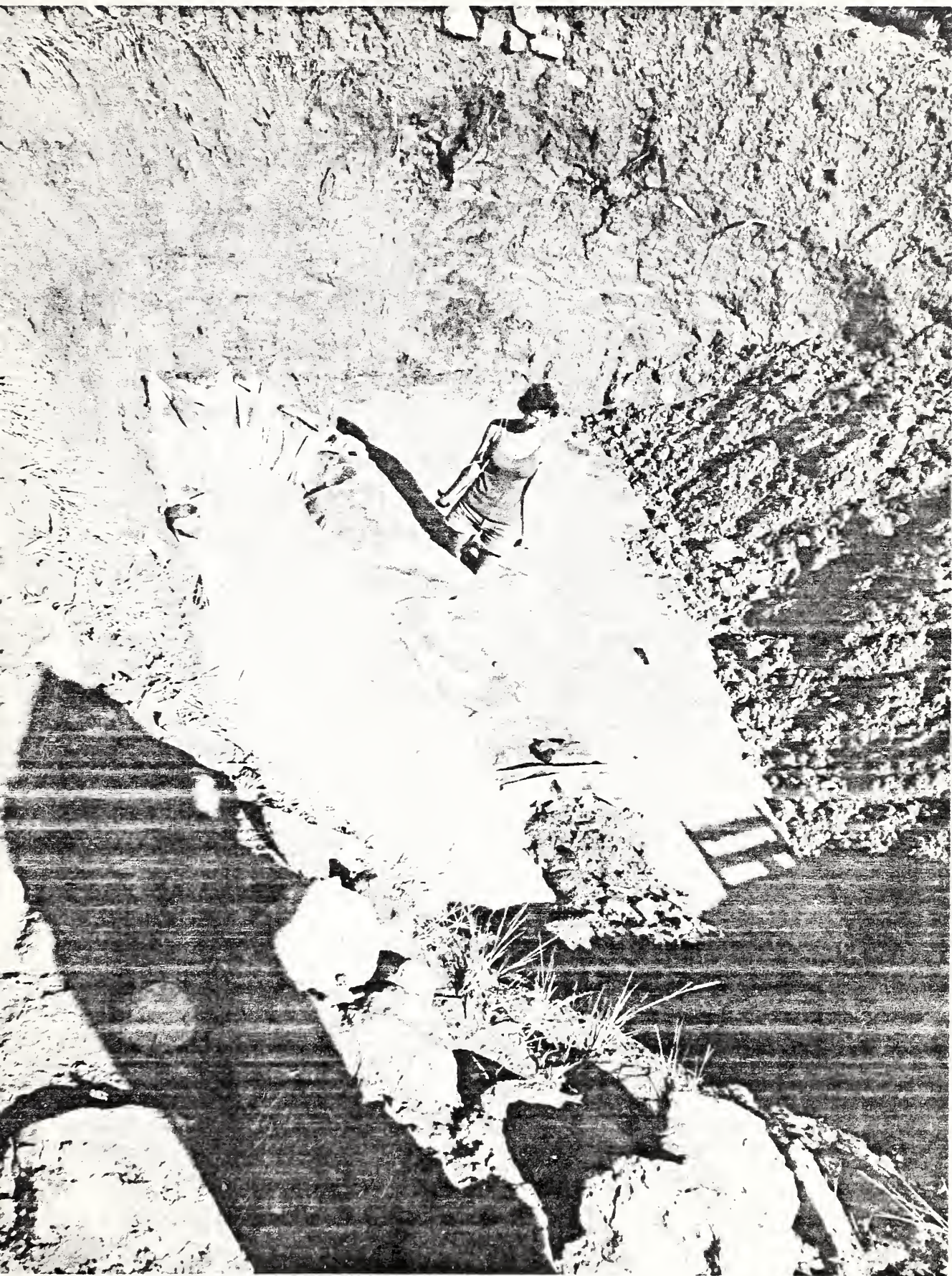
Supplementary Outbuildings: Composite Description

About one in six pit houses has a surface outbuilding. These supplementary units may be built on any side. Outbuildings for surface houses are rare. The pit house outbuilding contains from one to four rooms as an average. In one instance, a large pit house had a large outbuilding with no fewer than 20 rooms built in a half arc around the central feature. The rooms are of small size, varying from 4 to 8 feet along a wall. These buildings may be built of thin stone walls, poles encased in mud, adobe alone, or combinations of the three.

The full use of outbuildings remains to be fully comprehended. At present, the list of uses includes corn drying, storage, turkey pens, meal rooms, turkey burials, and human burials.

TABLE 2
KEY FOR DIAGRAMS TO GALLINA
ARCHITECTURAL FEATURES

a - All bins	l - Boulders in wall
b - Hearth	m - Sub-floor cist
c - Niches	n - Secondary wall
d - All floor slabs	o - Secondary banquette
e - Banquette	p - Banquette cist
f - Ventilator	q - Logs
g - Deflector	r - Partition
h - All posts or post holes	s - Ash pit
i - Platforms	t - Wood rebar
j - Sub-floor cist	u - Meal room
k - Ventilator cover (?)	x - Unknown



GENERAL EXCAVATION

AR-03-10-02-33 (Site 33) Surface House

This large surface house was built on a sage brush covered flat less than .1 mile north of Alkali Spring. This is one of two surface sites on the flat. At present, a number of small arroyos dissect the area, endangering the site. The site was excavated because of its topographic position; sites on valley flats are not common.

The house was not burned and the soil was unusually compact. It appears to have been dismantled of both its roof and flagstone floor after abandonment. There is also a possibility it was never completed which would account for the lack of ash in the hearth along with the absence of posts or post molds for three of the vertical uprights, the absence of a deflector, and the incomplete stone flooring.

The bench was constructed entirely of coursed adobe and not the ubiquitous stone-mud construction. Niches occur in the east and west walls. In the northwest corner, a depression in the bench suggests the beginning of a bin. Artifacts were very few in number. A date estimate is difficult but, by comparisons with similar tree ring dated structures, is that it was built in the first half of the 13th century.

Location. SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 3, T. 25 N., R. 1 E., NMPM, Llaves
15 minute quadrangle.

Elevation. 7,080 feet

Date of excavation. June-July 1972

Condition. Fair, some features were complete.

Shape. Approximately square, north wall 23.5 feet, east wall 21.5 feet, south wall 23.5 feet, west wall 21 feet, in length.

Depth. Highest point, north wall 6.5 feet, east wall 6 feet, south wall 6.5 feet, west wall 5.8 feet (average depth 6.2 feet).

Walls. Medium sandstone blocks fitted with adobe mortar, with plaster existing on the inside walls only. Average thickness 5 feet.

Plaster. Adobe in a number of layers (the exact number is unknown, but about seven layers were thought to exist). The plaster was muddy in color, with noticeable weathering altering its condition.

Main floor. Adobe layer partially covered with flagstone.

Anti-room floor. Unflagged adobe layer.

Banquette. North wall 19 feet, east wall 14 feet, west wall 13 feet, in length. Average height 3 feet, average width 1.8 feet.



Main bins. a1 and a2 length 8 feet, depth 3 feet, width 3.5 feet, wall thickness 6 inches (?). a3 length 7.5 feet, depth 3 feet, width 2.4 feet, wall thickness 6 inches (?).

Banquette bins. Absent.

Bin holes. Absent.

Deflector. Absent.

Hearth. Hexagonal and stone lined. North-south length 1.7 inches, east-west length 20 inches, depth 1.5 feet, distance from ventilator 7 feet.

Ventilator. Located in the south wall. Height of opening to the room 4.5 feet, depth 3.5 feet, width 1.5 feet, outside opening north-south 1 foot, east-west 1 foot.

Niches. c1 = Diameter 4 inches, depth 5.0 inches above banquette 10 inches.
c2 = Diameter 3 inches, depth 4.5 inches above banquette 8 inches.
c3 = Diameter 3 inches, depth 4.0 inches above banquette 9 inches.

Posts. Only one found, the other three were absent. Southwest post in bin partition diameter 8 inches, depth 7 inches.

Roof. Unknown, apparently gone.

AR-03-10-02-80 (Site 80) Surface House

This vandalized surface site was salvaged in 1972. Most of the interior features were destroyed, but the bench and ventilator were still intact and unexcavated. Foundations of bins and the deflector could be traced and the shallow hearth was still evident.

The house was built on a talus projection on the southeast end of Mud Spring Ridge. It was built on the east edge of a steep slope 80 feet above the valley overlooking the broad Chupadero Arroyo flats toward Alkali Spring. Nearby and south is the site of the removed Chupadero Ranger Station.

The structure is part of a village containing four pit houses and five surface houses distributed haphazardly over some 15 acres. Near the east center is the remnant of a tall cone-shaped pile of stone that we conjecture was a silo. It was badly vandalized.

It was in this village that the first scientifically excavated surface house in the Gallina was done by H. P. Mera and Stanley Stubbs of the Museum of New Mexico between 1931 and 1933. It has the site number LA 654 and is designated "Chupadero Ranger Station" as an

alternate name. To this house, the construction date of A.D. 1260 was assigned by tree rings (Robinson, W.J. and R.L. Warren 1971, p. 21). We conjecture the site is number AR-03-10-02-83 in our inventory.

The house had burned with a medium intensity, or the plaster was reddened but not fused. The shape is oval and not rectangular as is the common shape of most surface houses. Some other uncommon features within the structure were an oval stone slab, with a small hole drilled in the center and fitted with a carefully chipped cover (m) that filled the floor of the ventilator (f). Also, the ventilator was flanked on the west by a quadrilateral niche (c6) and on the east a rectangular niche (c7).

A large flat stone (k) lying in front of the ventilator fitted the opening. We conjecture it might be a ventilator cover to control air flowing into the room. We have encountered four other instances of such a stone slab near the ventilator, but never in place.

There were five niches in the west wall (c1-c5) and two niches in the bench on the north side (c8-c9). A cache of eight lightening stones was found in c8. Two small horizontal logs (q) were incorporated in the northwest and northeast surface of the bench, their purpose unknown. A narrow subsidiary bench was constructed on top of the lower bench on the north side (e). The area around the fireplace is unpaved. The shallow unlined fireplace is uncommon.

Location. NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 4, T. 25 N., R. 1 E., NMPM, Llaves
15 minute quadrangle.

Elevation. 7,280 feet

Date of excavation. July-August 1972

Condition. Totally excavated by some unknown individual and left in a badly eroded state of condition.

Shape. Approximately round. North-south diameter 20 feet, east-west 19.6 feet (not a pit house).

Depth. Highest point, north wall 5 feet, east wall 5.5 feet, south wall 5.8 feet, west wall 5 feet (average depth 5.5 feet).

Walls. Medium sandstone blocks fitted with adobe mortar, with plaster existing on the inside walls. Average thickness 4.5 feet.

Plaster. Adobe in a number of layers (the exact number is unknown), but its thickness ranged from 2.5 inches to 4 inches. Weathering had altered most of the existing plaster, but some red did appear due to some type of burning.

Main floor. Adobe layer covered with flagstones; however, they are absent around the hearth.

Anti-room floor. Unflagged adobe layer.

Banquette. North wall 13 feet, east wall 11.5 feet, west wall 12 feet, in length. Average height 2 feet, average width 1.8 feet.

Main bins. a1 and a2 length 4 feet, depth 1.6 feet, wall thickness 6 inches; a3 and a4 length 5 feet, depth 1.6 feet, wall thickness 6 inches.

Banquette bins. Absent

Bin holes. Absent

Deflector. "U" shaped, south wall 2.4 feet, west wall 1.5 feet, east wall 1.6 feet (?), wall thickness 6 inches.

Hearth. Pentagonal, unlined. North-south length 1.8 inches, east-west length 1.7 inches, depth 4.5 inches. Distance from ventilator 7.5 feet.

Ventilator. Located in the south wall, and depressed 3 inches below the floor, height of opening to the room 2 feet, depth 2.5 feet, width 1.7 feet, outside opening north-south 1.8 feet, east-west 1.7 feet.

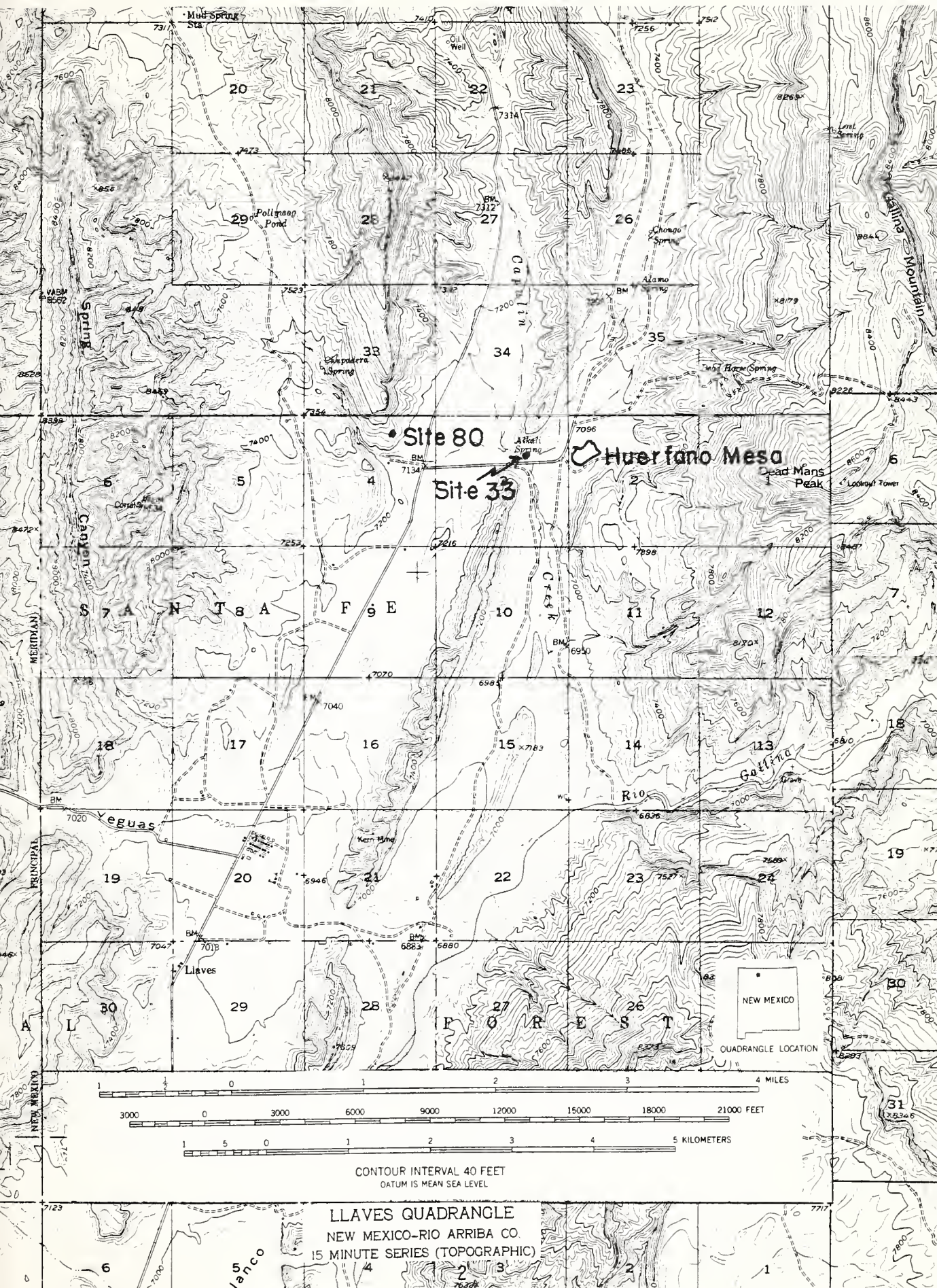
Niches. c1 = Diameter 5.0 inches, depth 17.5 inches, above banquette (?)
c2 = Diameter 5.0 inches, depth 12.0 inches, above banquette (?)
c3 = Diameter 8.0 inches, depth 22.0 inches, above banquette (?)
c4 = Diameter 5.0 inches, depth 12.0 inches, above banquette (?)
c5 = Diameter 3.5 inches, depth 8.0 inches, above banquette (?)
c6 = Diameter 12.5 inches, depth 18.0 inches, above floor 9 inches
c7 = Diameter 20.0 inches, depth 18.0 inches, above floor 11 inches
c8 = Diameter 14 x 9 inches, depth 14.0 inches, in banquette
c9 = Diameter 13 x 20 inches, depth 10.0 inches, in banquette

Posts. North posts in the banquette: Northeast post diameter 8 inches, depth 9 inches, northwest post diameter 8 inches, depth 8.5 inches.

Southeast post in bin partition diameter 9 inches, depth 6 inches, southwest post in bin partition diameter 9 inches, depth 7 inches.

Ventilator post diameter 6.5 inches, depth 6 inches.

Roof. Unknown, previously excavated.



HUERFANO MESA^{1/} EXCAVATIONS

Huerfano Mesa (map 1) ($S\frac{1}{2}NW\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM), about 30 acres in size, is an erosional feature of alternating beds of clay and sandstone of Cretaceous age. The mesa at its highest point on the west side is 8 feet above the flats. The north, west and south sides form a scarp 40 feet high. The northeastern end is gently sloped. The nearest potable water is Alkali Spring, .4 mile due west.

On the top are 11 pit houses, five single room surface houses, and one double room surface house. The houses form no definitive pattern and are placed from the edge of the mesa to the interior.

In the center, running from the south edge to the north edge, is a shallow fault zone forming an elongated depression which divides the mesa into separate units, a west half and an east half. The edges have growths of pinyon, ponderosa pine, juniper, and scrub oak. The top is covered with sage and a scattering of trees.

The mesa is a single physiographic entity on which settlers would be neighbors and have close face-to-face relations. The houses constitute a community. Some of the problems to be resolved at this time involve the basic relationship of structures. What is the relationship of the pit houses to the surface houses? Do these houses constitute a community of extended kin? Were the structures occupied at the same time, or is there an evolving sequence? What was the population at any given time of occupation? What was the cause of complete abandonment?

The Excavated Structures on Huerfano Mesa

AR-03-10-02-01 (Site 1) Surface House

This site is located on the northeast end of Huerfano Mesa. The mesa tapers gently; the topography is relatively flat.

^{1/} The term "Huerfano Mesa" (Orphan Table) was applied by Mr. Paul Casados who had a cattle permit for this area from the Forest Service.

This surface house is not as well constructed as previous houses excavated. Rodent activity was and is extreme. The stone floor (d) is crude and occupies less than one half of the south half of the main room. It is conjectured most of the stones had been removed. The four vertical roof support posts had been removed; not a trace remained but portions of the post molds were present.

The ventilator tunnel was well supported with log braces (q). The floor of the tunnel was raised 8 inches above the anti-room floor.

A shallow cist (m) once covered with stone slabs existed in the southeast corner of the main room. The cist was empty.

We suspect the floor stones were laid first and the main bins built after. The north wall of bin a3 was built over a floor slab.

A cache of several manos was found under the south wall of bin a3, the anti-chamber side.

The bench (e) was constructed principally of mud with a layer of stone at the base and at the top.

Location. $SE\frac{1}{4}NW\frac{1}{4}NW\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPPM, Llaves
15 minute quadrangle.

Elevation. 7,120 feet

Date of Excavation. July 1974

Condition. Fair, unburned

Shape. Rectangular. North wall 18.9 feet, east wall 19.4 feet, south wall 18.5 feet, west wall 18.4 feet.

Depth. 4.5 feet

Walls. Large sandstone blocks set with adobe mortar. Width 4.5 feet.

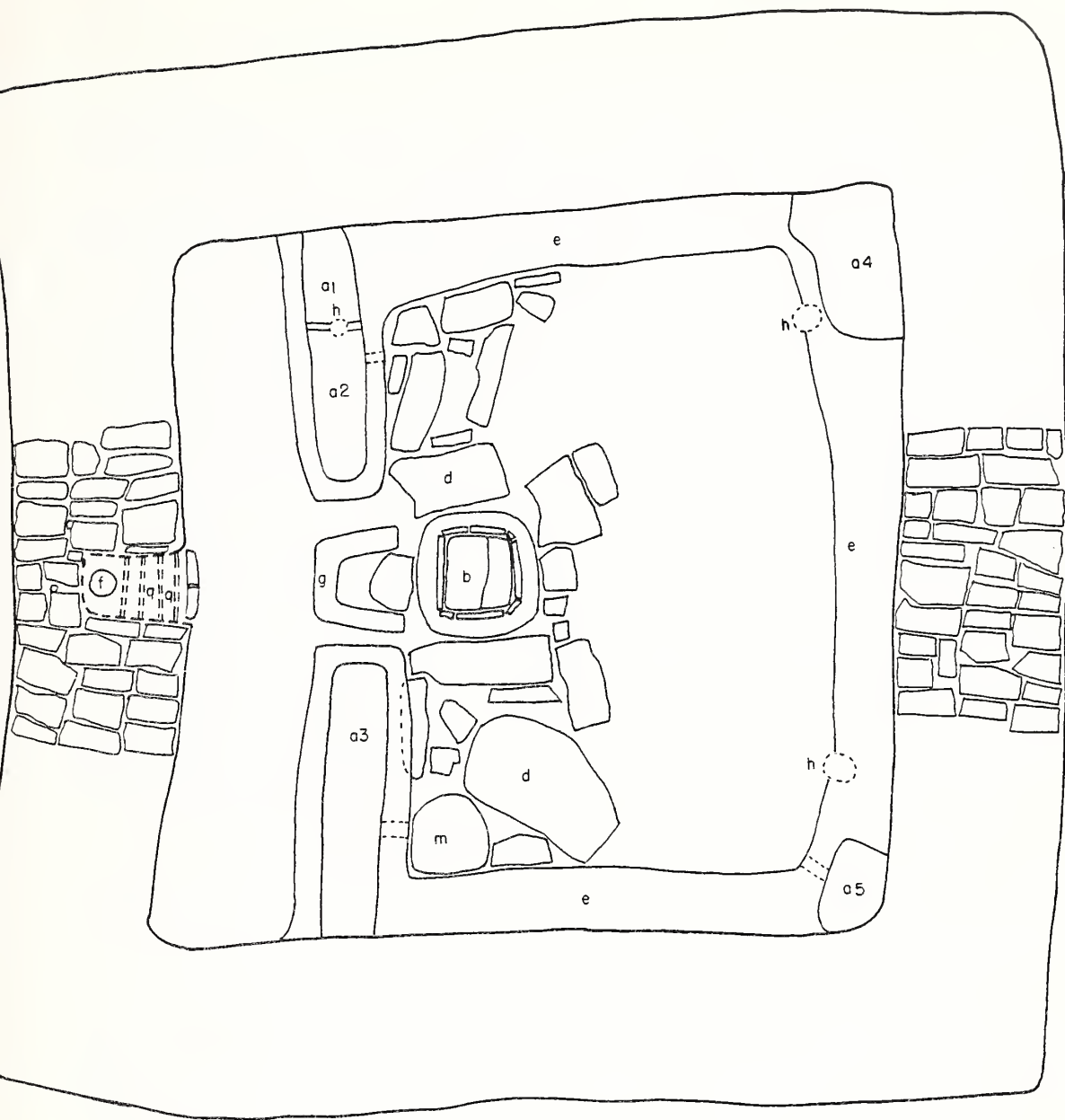
Plaster. Five thin coats over base coarse coat. One thin red plaster on original surface, four light gray coats, all sandy.

Main floor. Occasional flagstone, most probably removed after house abandonment in prehistoric time.

Anti-room floor. Unflagged adobe

Banquette. Largely adobe construction with upper and lower layer of sandstone blocks. Height 4.0 feet, width 2.0 feet.

Main bins. West bin length 7.92 feet, width 2.17 feet, depth 2.66 feet, east bin length 7.17 feet, width 2.25 feet, depth 2.50 feet. Wall thickness 7 inches.



Surface House 1

0 1 2 3 4 5ft.

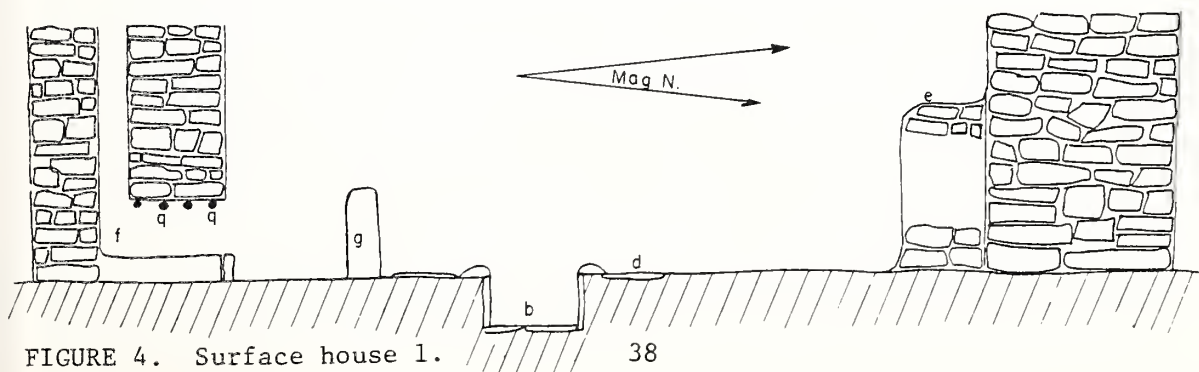


FIGURE 4. Surface house 1.

Banquette bins. Northwest corner east-west length 4.58 feet, north-south length 2.83 feet, width 1.66 feet, depth 2.83 feet. Northeast corner east-west, north-south lengths 1.84 feet, depth 2.0 feet.

Bin holes. (see map) All face main room. a2-diameter 3 inches, above floor 2 inches; a3-diameter 5 inches, floor level; a4-diameter 5 inches, above floor $2\frac{1}{2}$ inches; a5-diameter 4 inches, above floor 6 inches.

Deflector. "U" shaped. Length north-south 1.58 feet, width 1.54 feet. Wall thickness 9 inches. Height 2.17 feet. Distance from ventilator 3.25 feet.

Hearth. Square, stone lined, remodeled. North-south 2.25 feet, east-west 2.25 feet, depth 1.12 feet. Collar height 4 inches, width 7 inches.

Ventilator. Located in south wall, elevated $7\frac{1}{2}$ inches above floor. Height 1.33 feet, width 1.67 feet, length 3.0 feet.

Niches. None

Posts. North posts in banquette: northeast post diameter 9 inches, depth 2.0 feet. Northwest post diameter 9 inches, depth 2.33 feet. South posts in bins missing.

Roof. No evidence

Sub-floor cists. Northeast corner of east bin in main room diameter 2.09 feet, depth 1.5 feet.

AR-03-10-02-02 (Site 2) Pit House

This round pit house is located on the northeast side of the west half of Huerfano Mesa. The depth is 7.5 feet.

The builders encountered a number of large boulders in their excavation which they pecked to conform with the earth walls. A large boulder (l) in the wall just west of the ventilator showed evidence of intense heating and battering. A small cone-shaped vertical depression 3 inches in depth and 4 inches in diameter was placed in a shelf of the boulder. Another boulder encountered in the construction of the bench was left in place unaltered. A large sandstone slab (k) in front of the ventilator, but flat on the floor, could have served as a ventilator cover. Four articulated human, lower lumbar vertebrae were found on the floor in the west bin (al). The deflector (g) displayed longer than usual, east and west parallel walls.

Location. SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves 15 minute quadrangle.

Elevation. 7,120 feet

Date of excavation. June-August 1973

Condition. Good, most features were complete.

Shape. Round pit house. North-south diameter 21 feet, east-west diameter 22.5 feet.

Depth. Highest point, north wall 7.5 feet, east wall 7 feet, south wall 7.5 feet, west wall 7 feet (average depth 7.2 feet).

Walls. Soil, plastered with adobe; however, numerous rocks had been worked on that were apparently obstacles during the construction.

Plaster. Seven adobe layers existed on the soil. They were brown to white in color.

Main floor. Adobe layer with one flagstone north of bin a1.

Anti-room floor. Unflagged adobe layer.

Banquette. Continual from bin to bin, average height 1.3 feet, average width 1.8 feet.

Main bins. a1 length 6 feet, depth 1.8 feet, width 1.6 feet, wall thickness 5 inches; a2 length 7 feet, depth 1.8 feet, width 2 feet, wall thickness 5 inches.

Banquette bins. Absent

Bin holes. Absent

Deflector. "U" shaped. South wall 1.8 feet, east wall 3 feet, west wall 2.5 feet, wall thickness 5 inches.

Hearth. Round and unlined. North-south diameter 2 feet, east-west diameter 2 feet, depth 10 inches. Distance from ventilator 9.5 feet.

Ventilator. Located in the south part of the room, and elevated 2.5 inches from the floor. Height of opening to the room 1.8 feet, depth 4.5 feet, width 1.7 feet, outside opening unknown.

Niches. Absent

Posts. North posts in banquette: Northeast post diameter 8 inches, depth 9 inches. Northwest post diameter 8.5 inches, depth 8 inches. Southwest post in bin a1 diameter 6 inches, depth 7 inches. Southeast post in bin a2 diameter 6 inches (?), depth 7 inches (?).

Roof. Unknown, absent

AR-03-10-02-03 (Site 3) Pit House

We have tentatively dendrodated this rectangular, burned pit house at A.D. 1230. It is located 20 feet west of surface house 4. Site 3 was abandoned for a length of time and then partially filled when the west wall of site 4 collapsed, spilling rocks throughout the pit house. Rocks from the collapsed wall led us to discover the pit house.



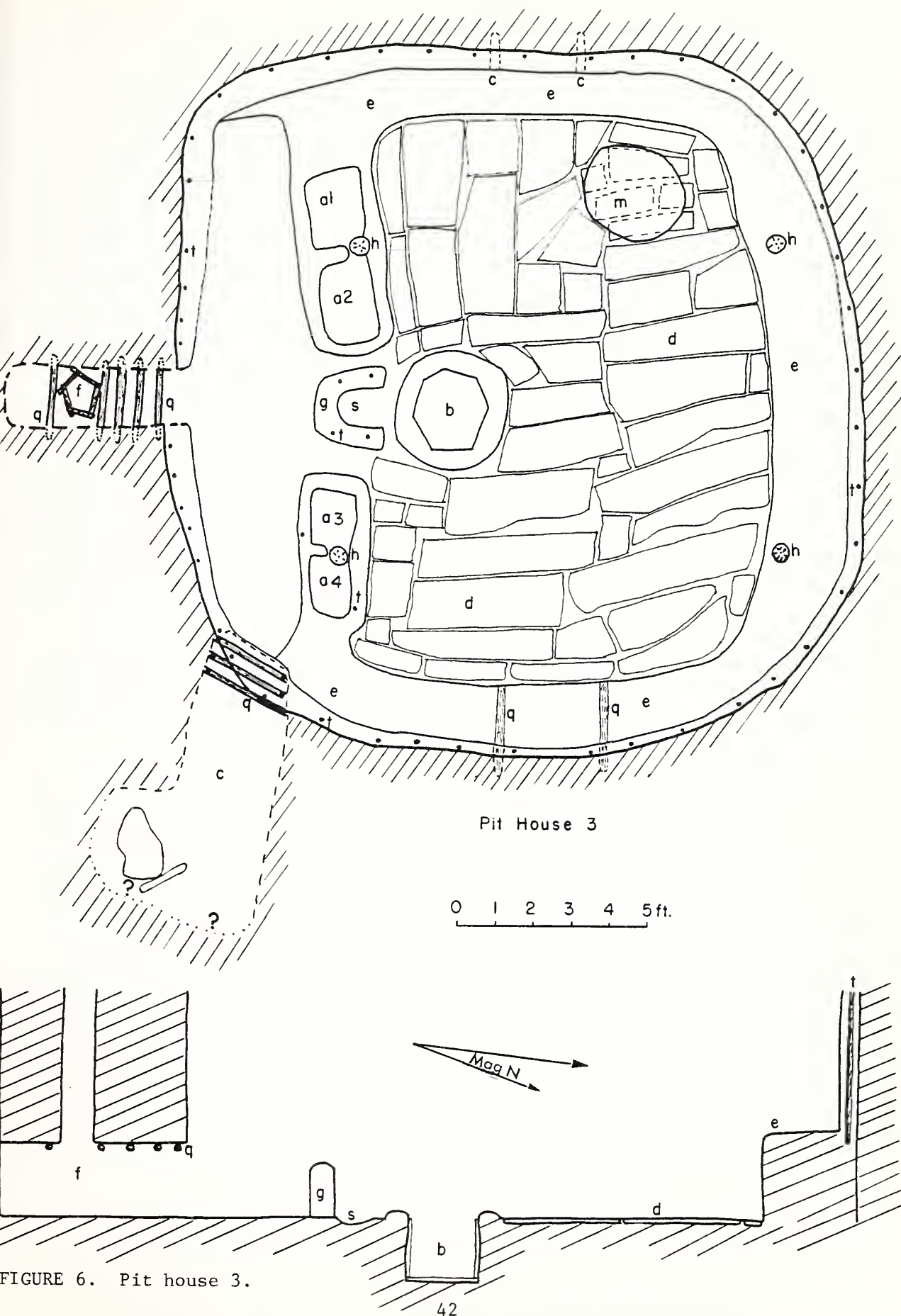


FIGURE 6. Pit house 3.

After the Indians completed the excavation of the pit, including bench, they placed vertical wooden rebars from the back surface of the bench to the top of the inside wall. These rebars, 2 to 4 inches in diameter, were placed about 1 foot apart around the inside circumference of the house. Evidence of ties of yucca leaves and willow withes is present. These are commonly found in cliff house walls. Rebar poles were placed in the walls of the east bin and in the core of the deflector. None were found in the west bin.

A tunnel or large niche opens into the southeast corner of the anti-room. It was traced 7.5 feet to the east toward the south part of surface site 4. The roof at the entrance is braced by small vertical posts; and the roof here was supported by three small logs, none over 3 inches in diameter. The tunnel or niche is badly disturbed by rodent and other animal activity. A skull of a bobcat and miscellaneous bones of a human were found in the water-sorted fill. The lateness of the excavation season, coupled with the danger of tunneling, prevented this feature being fully explored. It is conjectured there is a possibility the tunnel might enter under the floor of house 4 and might extrude through an unexplained deep cist (see site 4, m) discovered near the ventilator the previous season.

A sub-floor cist (m) near the northwest corner of the main room, paved with floor slabs, contained a large Gallina B/g olla filled with several hundred pieces of calcareous tufa, each had been rubbed. Other items were well rubbed botryoidal chalcedony lightening stones.

A trait of some importance is the evidence of cord markings on the north face of the west bin. These were covered with a paper-thin plaster. Paddling was used in the original construction.

Three inches below the top of the north side wall of the west bin were a series of 10 shallow, elliptical holes averaging 2 inches high, $1\frac{1}{4}$ inches wide, and $1\frac{1}{4}$ inches deep. Placed through these horizontally was a 5/16-inch wooden rod, with a space between the back of the rod and the hole. The hole spacing ranges from $2\frac{1}{2}$ inches apart to $9\frac{1}{2}$ inches; the mold is 5 inches. It is unlikely these were loom holes. With experimentation with string, it is conjectured these were used for fiber string twisting or for twisting fur strips in the manufacture of fur blankets. It is not difficult to tie the string to the horizontal stick; and, if our conjecture is correct, it is a clever technical device.

The horizontal shaft of the ventilator was originally excavated as a trench rather than a tunnel and roofed with 6-inch diameter logs spaced from 3 to 5 inches apart. The vertical shaft had a crib work of small logs with a hole in the center. The tunnel was excavated for a distance of 4.6 feet; the vertical shaft was placed not at the end but was forward 1.65 feet from the end.

The burned roofing debris contained several hundred segments of baked clay roof bins. These were constructed with closely spaced vertical wooden rebars. This is the first evidence of roof bins on Huerfano Mesa, but they do occur at two surface houses several miles west of the mesa. Similar surface evidence was noted on two pit houses on Golondrina Mesa, 5 miles east of Huerfano Mesa.

Location. NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves 15 minute quadrangle.

Elevation. 7,120 feet

Date of excavation. June-July 1973, June-July 1974

Condition. Good, fully burned

Shape. Rectangular pit house. North wall 16.2 feet, east wall 15.3 feet, south wall 15.5 feet, west wall 15.5 feet.

Depth. Average 6.0 feet

Walls. Native soil, wooden rebars throughout.

Plaster. Thick rough-coat 2-4 inches thick embedding vertical rebars. Two fine coats.

Main floor. Totally covered with flagstones.

Anti-room floor. Unflagged adobe layer.

Banquette. Excavated native soil. Width 1.7 feet, height 2.4 feet.

Main bins. (West) Length 5.1 feet, width 2.0 feet, height 2.1 feet. (East) Length 5.0 feet, width 2.0 feet, height 2.1 feet. Wall thickness 6 inches, center partitions width 4 inches.

Banquette bins. None

Bin holes. All face main room, two contain cobble closure from inside, others clay plus. a1-diameter 6-3/4 inches, height above floor 5 inches; a2-diameter 5 $\frac{1}{4}$ inches, height above floor 3 $\frac{1}{2}$ inches; a3-diameter 4 $\frac{1}{2}$ inches, height above floor 8 inches; a4-diameter 3/4 inch, height above floor 8 inches.

Deflector. "U" shaped. Width 2.4 feet, length 2.4 feet, height 1.5 feet, wall thickness 7 inches. Distance from ventilator 4.0 feet.

Hearth. Septagonal, stone lined. North-south length 2.0 feet, east-west length 2.3 feet, depth 1.75 feet. Collar height 3 inches, width 6 inches. Distance from ventilator 5.5 feet.



Ventilator. Located in south wall. Floor level with anti-room floor. Height 2.0 feet, width 1.2 feet, length 4.6 feet. Vertical shaft opening 3.4 feet from front (wooden cribbing) orifice north-south .92 foot, east-west 1.25 feet.

Niches. (Tunnel?) Southeast corner anti-room, front entrance width 1.3 feet, height 1.85 feet. Total length excavated 7.65 feet, back width 4.4 feet.

Posts. (In banquette) Northwest post diameter 7 inches, depth 8 inches; northeast post diameter $5\frac{1}{2}$ inches, depth 10 inches. (In bin partitions) Southwest post diameter 6 inches, depth 3 inches; southeast post diameter $5\frac{1}{2}$ inches, depth 3 inches.

Roof. Two large beams running north-south supported by vertical uprights, diameter 9 inches. Pole room stringers 4 inches diameter, mud layer 2-4 inches thick.

Roof bins. Yes

Sub-floor cist. Northwest corner main room. East-west diameter 1.42 feet, north-south diameter 2.65 feet, depth 1.71 feet. Contained large Gallina B/g olla filled with medicine stones.

AR-03-10-02-04 (Site 4) Surface House

This rectangular surface house, located 20 feet east of the burned rectangular pit house 3, contained several unusual features. The house underwent a slow deterioration. Three of the vertical roof supports had been removed before the roof caved. It is conjectured that the two beams running north-south were firmly embedded in the walls. Lending credence to this hypothesis was the large number of stone roof slabs encountered in the upper fill. These appear to have remained in place after the vertical supports were removed. The position of the slabs, all of which were carefully mapped, indicated the roof deteriorated slowly.

The bench, badly eroded, had been constructed with a pink sandy clay with only a few stones. A strange "cupboard" affair was built in the northwest corner. It was hollow with thin walls and built to a height of 3 feet with a small oval opening one foot above the floor. A large sherd of pottery was found inside. In most surface houses, the bench is constructed of stone and mud.

The east and west bins were badly eroded. A cist, 2 feet deep, was excavated on the west side of the ventilator in the anti-chamber. It was covered by a large, flat slab with a carefully shaped, deep, concave

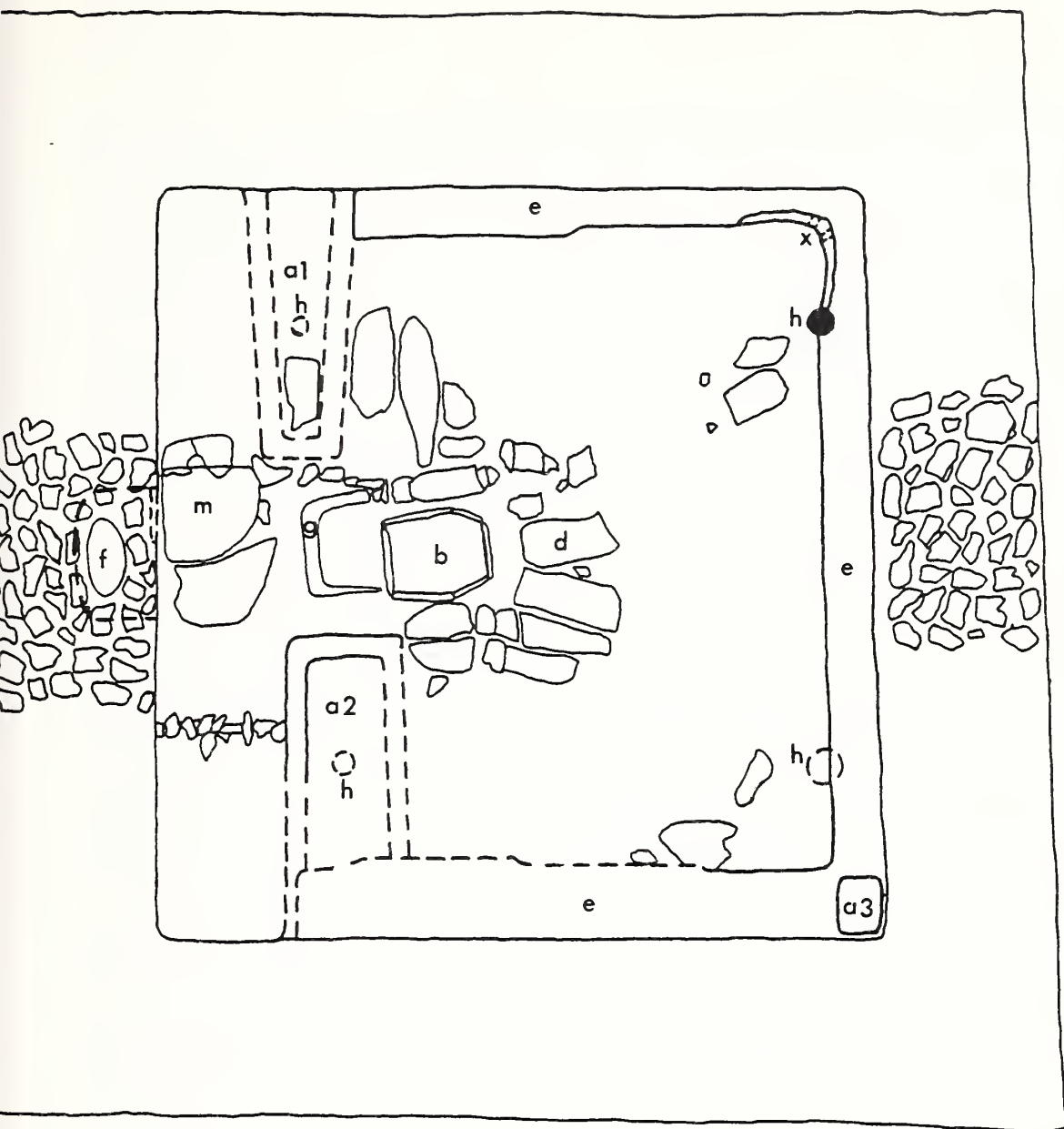
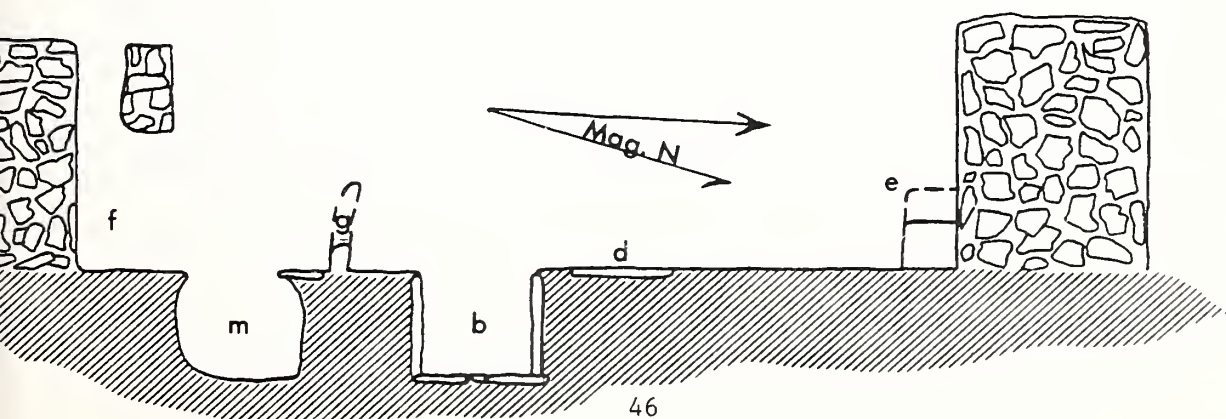


FIGURE 7. Surface house 4.

0 1 2 3 4 5 ft.

Surface House 4



notch near one corner. We conjecture the cist was excavated, perhaps after the house was abandoned. Still to be explored is the possibility that the cist represents an entrance to a tunnel discovered late in the 1974 season, which issued from the southeast corner of the burned pit house 3. We traced the tunnel (?) for 7.5 feet in the direction of the cist in site 4, but the season drew to a close before completion.

Other aspects recorded for this unusual house are that some three-fourths of the floor slabs had been removed, probably after abandonment; the hearth is unusually large and deep; an disarticulated male, adult, human skeleton was strewn on the floor on the west side of the room (see Chase, this report, burial 5, house 4).

Location. SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$, Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves 15 minute quadrangle.

Elevation. 7,120 feet

Date of excavation. June-July 1973

Condition. Poor, badly eroded.

Shape. Approximately square. North wall 16.8 feet, east wall 16 feet, south wall 16.8 feet, west wall 16.6 feet, in length.

Depth. Highest point, north wall 6 feet, east wall 5.5 feet, south wall 5.4 feet, west wall 5.6 feet (average depth 5.5 feet).

Walls. Medium sandstone blocks fitted with adobe mortar, with plaster existing on both the inside and outside of the walls. Average thickness 4 feet.

Plaster. Adobe in about three layers, brown in color, with noticeable weathering altering its condition.

Main floor. Adobe layer with some flagging around the hearth.

Anti-room floor. Adobe layer with a few scattered flagstones, and a rock partition between bin a2 and the south wall.

Banquette. North wall 14 feet, east wall 12 feet, west wall 11 feet in length. Average height 1.7 feet, average width 1.2 feet.

Main bins. a1 length 6 feet (?), depth unknown, width 2 feet, wall thickness 4 inches; a2 length 6.5 feet (?), depth unknown, width 2 feet, wall thickness 4 inches.

Banquette bins. a3 north-south length 1.5 feet, east-west length 1 foot, depth 8 inches.

Bin holes. Absent

Deflector. "U" shaped. South wall 2 feet, east wall 1.5 feet, west wall 1.5 feet, height 5 inches, but thought to be about 2 feet. Wall thickness 4 inches.

Hearth. Hexagonal and stone lined, north-south length 2.1 feet, east-west length 1.9 feet, depth 2.1 feet, distance from ventilator 5 feet.

Ventilator. Located in the south wall, at floor level, height of opening to the room 2.6 feet, depth 2 feet, width 3 feet. Outside opening north-south 10.5 inches, east-west 1.7 feet.

Niches. Absent

Posts. North posts in banquette: Northeast post diameter 8 inches (?), depth 7 inches (?); northwest post diameter 8 inches, depth 9 inches; southeast post diameter 4 inches (?), depth 5 inches (?); southwest post diameter 4 inches (?), depth 5 inches (?).

Roof. Unknown, totally collapsed. Although slabs appear to have been incorporated into it.

Sub-floor cist. In front of the ventilator in anti-room. North-south length 1.9 feet, east-west length 1.9 feet, depth 2 feet.

Unknown structure. In northwest corner of room incorporated into the wall and the banquette.

AR-03-10-02-07 (Site 7) Surface House

Site 7, a rectangular, unburned, surface house is located on the south edge of Huerfano Mesa where there is a commanding view south down the Chupadero drainage to the Gallinas River.

An unusual feature, immediately in front of the ventilator, was a small, rectangle of small cobbles outlining three stone slabs. We conjecture it served as a grinding area even though the tools were not present.

Other notable observations are: the ventilator is unusually wide; three-fourths of the floor slabs were removed after abandonment; all four of the vertical roof supports were charred at the base indicating these were originally felled by burning; and the north bench was unusually narrow.

Location. NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves 15 minute quadrangle.

Elevation. 7,120 feet

Date of excavation. June-July 1973

Condition. Good although the southwest corner was slumping.

Shape. Approximately square, north wall 18.8 feet, east wall 19 feet, south wall 19.2 feet, west wall 19 feet.

Depth. Highest point, north wall 6 feet, east wall 5.8 feet, south wall 5 feet, west wall 6 feet (average depth 5.7 feet).

Walls. Medium sandstone blocks fitted with adobe mortar, with plaster existing on the inside walls only. Average thickness 4 feet.

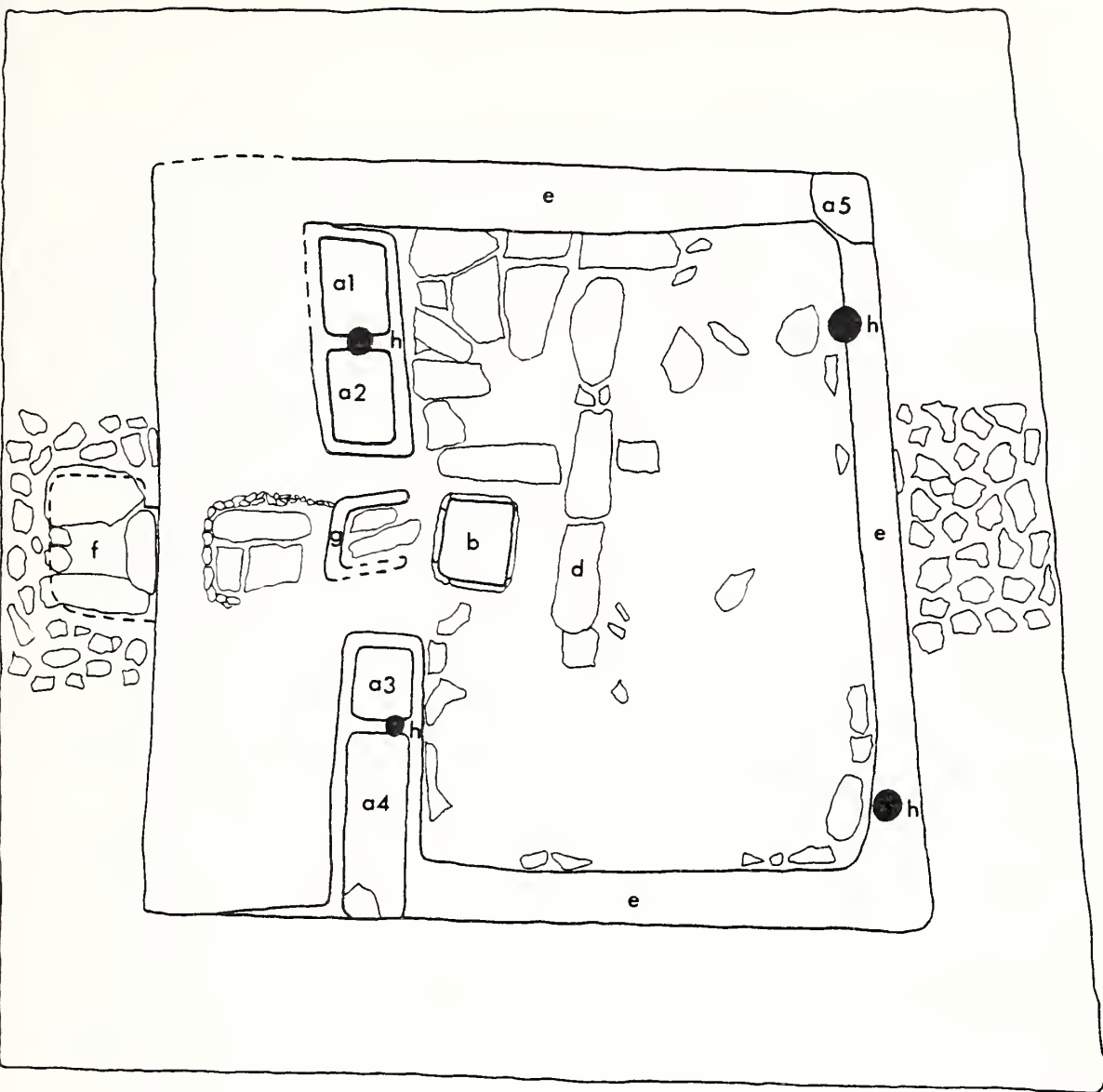
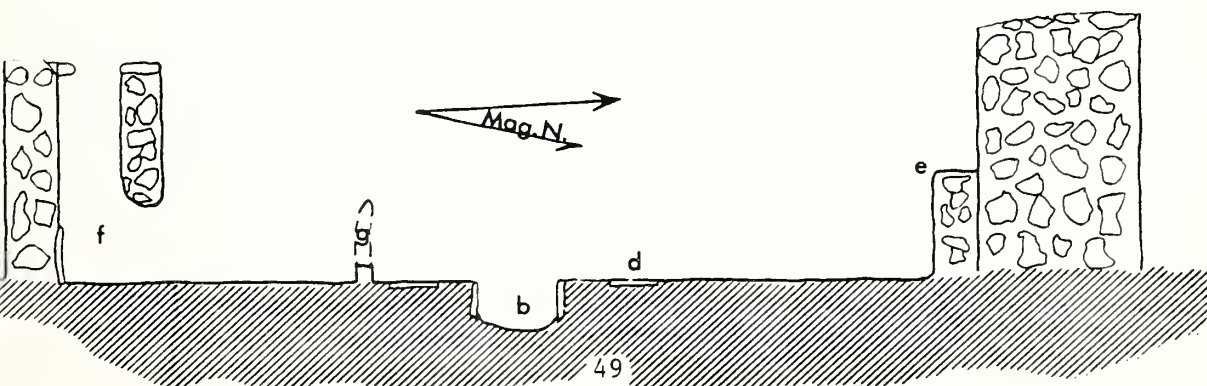


FIGURE 8. Surface house 7.

0 1 2 3 4 5ft.

Surface House 7



Plaster. Adobe in a number of layers (exact number is unknown), but its thickness ranged from 2.5 inches to .4 inch. The plaster was brown in color, with noticeable weathering altering its condition.

Main floor. Adobe layer partially covered with flagstones.

Anti-room floor. Adobe layer, with flagstones directly behind the deflector with small pebbles surrounding the south and west sides of the flagstones.

Banquette. North wall 16 feet, east wall 11.4 feet, west wall 13.5 feet, in length. Average height 2.6 feet, average width 13 inches.

Main bins. a1 and a2 length 6 feet, depth 2.5 feet, width 2.5 feet, wall thickness 5 inches; a3 and a4 length 7.5 feet, depth 2.5 feet, width 2.3 feet, wall thickness 5 inches.

Banquette bin. a5 north-south length 1.4 feet, east-west length 1.4 feet, depth 1.8 feet.

Bin holes. All faced the main room and contained an adobe plug.

a1 = Diameter 4.5 inches, height above floor 0 inches.

a2 = Diameter 4.5 inches, height above floor 4 inches.

a3 = Diameter 4.0 inches, height above floor 0 inches.

Deflector. "U" shaped, south wall 2.2 feet, east wall believed to be 2.4 feet, west wall 2.4 feet, in length. Height 6 inches, although thought to be about 2 feet, wall thickness 6 inches.

Hearth. Square and stone lined. North-south length 1.7 feet, east-west length 2 feet, depth 1 foot, distance from ventilator 7 feet.

Ventilator. Located in the south wall, at floor level. Height of opening to the room 1.6 feet, depth 2.5 feet, width 3.5 feet, outside opening north-south 9 inches, east-west 15 inches.

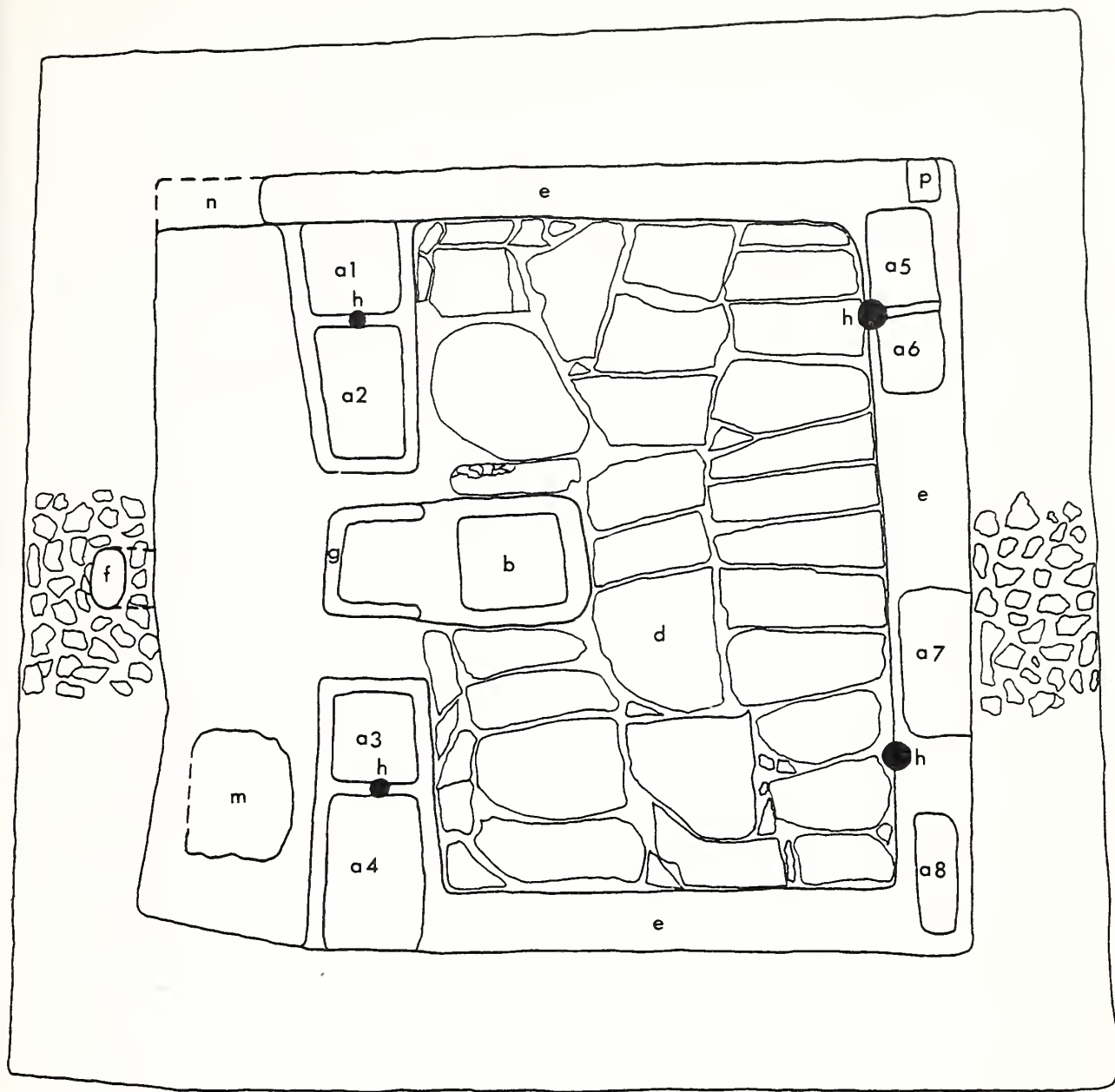
Niches. Absent

Posts. North posts in banquette: Northeast post diameter 8 inches, depth 9 inches; northwest post diameter 7 inches, depth 9 inches; southeast post in bin partition diameter 6 inches, depth 7 inches; southwest post in bin partition diameter 5 inches, depth 7 inches.

Roof. Unknown, totally collapsed

AR-03-10-02-08 (Site 8) Surface House

Site 8, an unburned surface house, is located on the south edge of Huerfano Mesa, 42 feet west of site 7. The interior of the house was in exceptionally good condition. All floor slabs were in place, and the upright roof supports had not been removed. It is probable the roof remained intact for some time after abandonment during which



0 1 2 3 4 5 6 7 ft.

Surface House 8

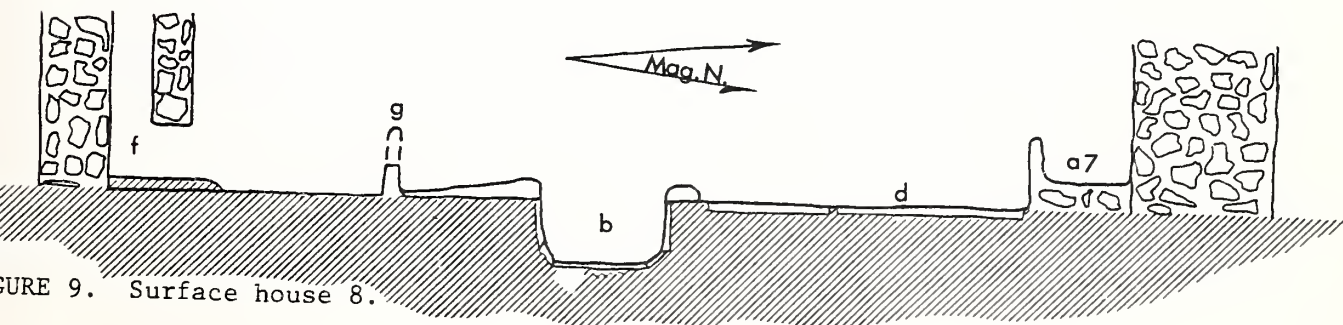


FIGURE 9. Surface house 8.

time the roof mud and eroding edges of the house gradually covered the interior features before the roof collapsed, thus preserving them. More important, a possible reason for Indians not dismantling the house was the presence of the burial in a cist in the southeast corner of the anti-room. We suspect most unburned houses were dismantled or misused by other inhabitants of the area, perhaps the children playing in the abandoned houses.

The burial (see Chase, this report, burial 1, house 8) was that of a male, 45+ years of age. He was placed on his back with knees tightly flexed to the chest. The sepulcher was covered with small logs and not filled with earth. Small bits of tissue adhered to the skull. The brain had shrunk to a $1\frac{1}{2}$ -inch diameter and was retrieved for a blood-type sample. Calcium growths were heavy on the vertebrae; a deep, but well-healed scar extended from the eye to the lamdoid suture across the right frontal. A number of squash seeds were found near the head.

Four storage bins were placed in the north bench; a greater number than normally occur in the Huerfano Mesa houses. The southwest corner had been rebuilt with an additional wall of stones and mud, 1.8 feet thick. The reason was a slipping of that corner which is very close to the mesa edge. Probably moisture and gravity were the causes.

Location. NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves
15 minute quadrangle.

Elevation. 7,120 feet

Date of excavation. July 1973

Condition. Good, although the southwest corner was slumping.

Shape. Approximately square, north wall 32.3 feet, east wall 34 feet, south wall 32.5 feet, in length.

Depth. Highest point, north wall 6 feet, east wall 5.8 feet, south wall 6 feet, west wall 6 feet (average depth 6 feet).

Walls. Medium sandstone blocks fitted with adobe mortar, with plaster existing on both the inside and outside of the walls. (Average thickness 4.5 feet)

Plaster. Adobe in a number of layers, about six were thought to exist. The plaster was brown in color.

Main floor. Adobe layer, totally covered with flagstones.

Anti-room floor. Unflagged adobe layer with one burial in the southeast corner.



Banquette. North wall 32.3 feet, east wall 22.5 feet, west wall 28.5 feet, in length. Average height 2.8 inches, average width 2.8 feet.

Main bins. a1 and a2 length 10 feet, depth 2.8 feet, width 4.5 feet, wall thickness 6 inches; a3 and a4 length 11 feet, depth 2.8 feet, width 4.8 feet, wall thickness 6 inches.

Banquette bins. a5 east-west length 4 feet, north-south width 2.5 feet, depth 1.4 feet; a6 east-west length 3 feet, north-south width 2.5 feet, depth 1.4 feet; a7 east-west length 6 feet, north-south width 2.5 feet, depth 1.4 feet; a8 east-west length 4.8 feet, north-south width 1.6 feet, depth 1.4 feet.

Bin holes. None

Deflector. "U" shaped. South wall 4 feet, east wall 4 feet, west wall 3.6 feet, height 1 foot (?), thought to be 2 feet, wall thickness 6 inches.

Hearth. Square and stone lined. North-south length 4 feet, east-west length 3.8 feet, depth 2.5 feet, distance from ventilator 12.4 feet. Note: Collar surrounds fireplace, width 8 inches, height 5 inches. Made of adobe.

Ventilator. Located in the south wall, elevated 3 inches above the floor. Height of opening to room 1.6 feet, depth 3 feet, width 2 feet, outside opening north-south 1 foot, east-west 2 feet.

Niches. One in banquette (p) north-south length 12 inches, east-west length 1.7 feet, depth 6 inches.

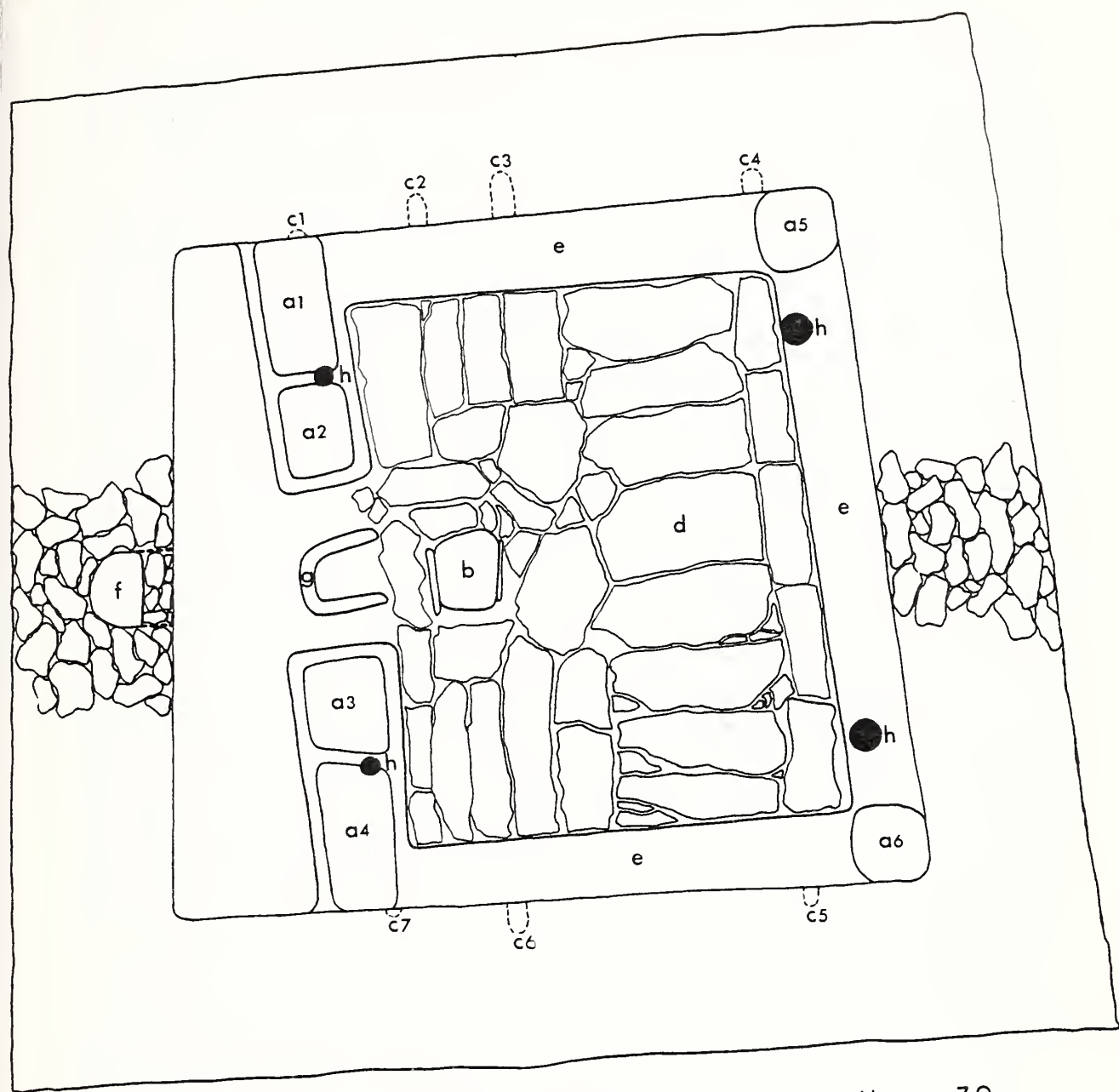
Posts. North posts in banquette: Northeast post diameter 1.2 feet, depth 1.8 inches. Northwest post diameter 1 foot, depth 1.5 feet. Southwest post in bin partition diameter 7 inches, depth 10 inches. Southeast post in bin partition diameter 6 inches, depth 11 inches.

Roof. Unknown, totally collapsed.

Sub-floor cist. North-south length 4 feet, east-west 5 feet, depth 2.5 feet, and contained a burial.

AR-03-10-02-30 (Site 30) Surface House

This surface house was thoroughly burned but in excellent condition. It is located at the northwest end of Huerfano Mesa. The features were baked to an orange-red color. In several instances, both pottery and walls were fused into a lava-like substance. The roof timbers were almost completely consumed by the heat. Temperatures in the house reached above 2100° F. (1150° C). Shale type clays bloat and blister above such a temperature. Such clay is valuable for pottery because it fires well at a low temperature. The clay contains a relatively high



0 1 2 3 4 5ft.

Surface House 30

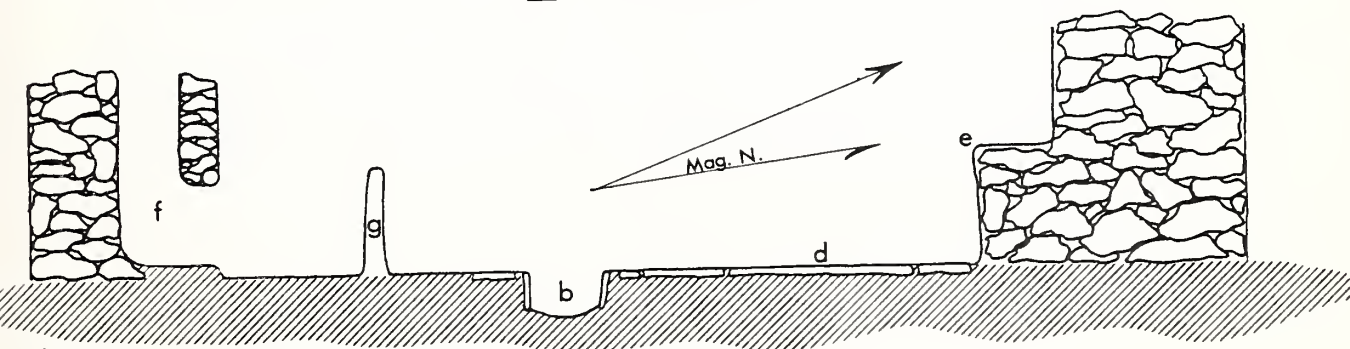


FIGURE 10. Surface house 30.

percentage of iron oxide, which serves as a flux that lowers the maturing temperature of the clay. The resulting vessels, because of this, remain rather fragile and porous. The porosity after firing is between five and fifteen percent. All Gallina vessels in this area were made with this "earthen ware" clay, as it is termed in the trade vernacular.

There was no evidence of roof bins. The inside bins were almost empty of corn. A quart of charred beans (Phaseolus vulgaris) was found in the northeast corner bench bin (a6) which had a sealed, stone top. Bushels of shelled corn were mixed with the roof debris and extended above the bench to the top of the ruined wall. Intermixed with the mass of detritus were the broken remains of 14 large, globular vessels with small orifices. A conjectural reconstruction of events is as follows: It was in late August or early September when the corn had been harvested, shelled and placed in the ollas on the roof, prior to filling the interior bins, when the house caught fire, destroying the house and grain. The intense burning can be attributed to two causes: the ventilator and the corn. Through the former, a draft was drawn, causing a strong air convection which fanned the fire with a forge-like intensity; the corn added fuel energy.

Two pointed base cooking vessels were resting in the ashes of the hearth; a charred digging stick lay in the east passage next to the deflector and hearth. An unofficial and unverified tree ring date counted in the Adams State College Anthropology Laboratory is A.D. 1241. This is not necessarily a bark date. This date has to be verified by the Tree Ring Laboratory, University of Arizona, Tucson, and is presented here as tentative. Seven small niches were found in the wall above the bench. Four occur in the west wall and three in the east wall; their use defied explanation.

Location. $SE\frac{1}{4}NW\frac{1}{4}NW\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves
15 minute quadrangle.

Elevation. 7,120 feet.

Date of excavation. June-August 1972

Condition. Totally burned, and the roof had collapsed down into the room.

Shape. Approximately square. North wall 17.5 feet, east wall 19 feet, south wall 16.5 feet, west wall 16.5 feet, in length.

Depth. Highest point, north wall 5 feet, east wall 5 feet, south wall 4.2 feet, west wall 5.6 feet (average depth 4.6 feet).

AR-03-10-02-30A (Site 30A) Pit House

Pit house 30A illustrates the importance of excavating all units on Huerfano Mesa. The site, located 40 feet north of surface house 30 and downslope 6 feet, is the first site encountered on Huerfano Mesa with the features oriented east-west and not north-south. This is the only house we have encountered in both literature and excavation oriented in such a manner in the northeast Gallina area. The east-west orientation was the habit of the Indians of the Gobernador area, 36 airline miles northwest of Huerfano Mesa (Hall, E. T., Jr., 1944, pp. 21-24). Other features of the Gobernador sites found in site 30A are the rectangular deflector, narrow bins, and the extension of the bins into the bench. Some differences found in the Gobernador that do not occur in 30 A are the arced plan of the bins, the long, narrow, horizontal tunnel with the bulbous vertical shaft at the end.

The representative Gobernador pit houses A and B, in site 12, have construction dates of A.D. 811 and 791, respectively (Hall, E. T., Jr., 1944, pp. 22, 25). We have estimated the date for pit house 30A at between A.D. 850-900, later than those of the Gobernador because of its more formal construction, more in keeping with the later Gallina pit houses.

The bins of site 30A are very narrow, averaging less than 1 foot for the inside dimension, hardly worth the effort of building if the storage of corn was the only purpose. They serve better as a room partition than storage space. The bench construction is unlike any thus far encountered. After the Indians excavated the circular pit for the room, an adobe wall 2 feet high was constructed around most of the circumference of the room about 1 foot from the thickly plastered wall. The back of this retaining wall was filled with yellow, sandy gravel and capped with a $4\frac{1}{2}$ -inch adobe layer, with a 1-inch high lip at the outside, top edge of the bench.

The floor of the pit house was filled to a depth of $6\frac{1}{2}$ inches with yellow, sandy gravel placed over the original excavation into a consolidated gravel layer, all of which was capped by a 5-inch thick, blue, shale clay which served as the floor. The pit of site 30A was completely filled at the time the nearby surface house 30 was burned. Not one fragment of burned adobe was found below the surface in the pit house. The nearness of site 30 and the slope would have distributed some material into the depression if it had not been long filled. It is conjectured that between 350 and 400 years separate the construction of the two structures.

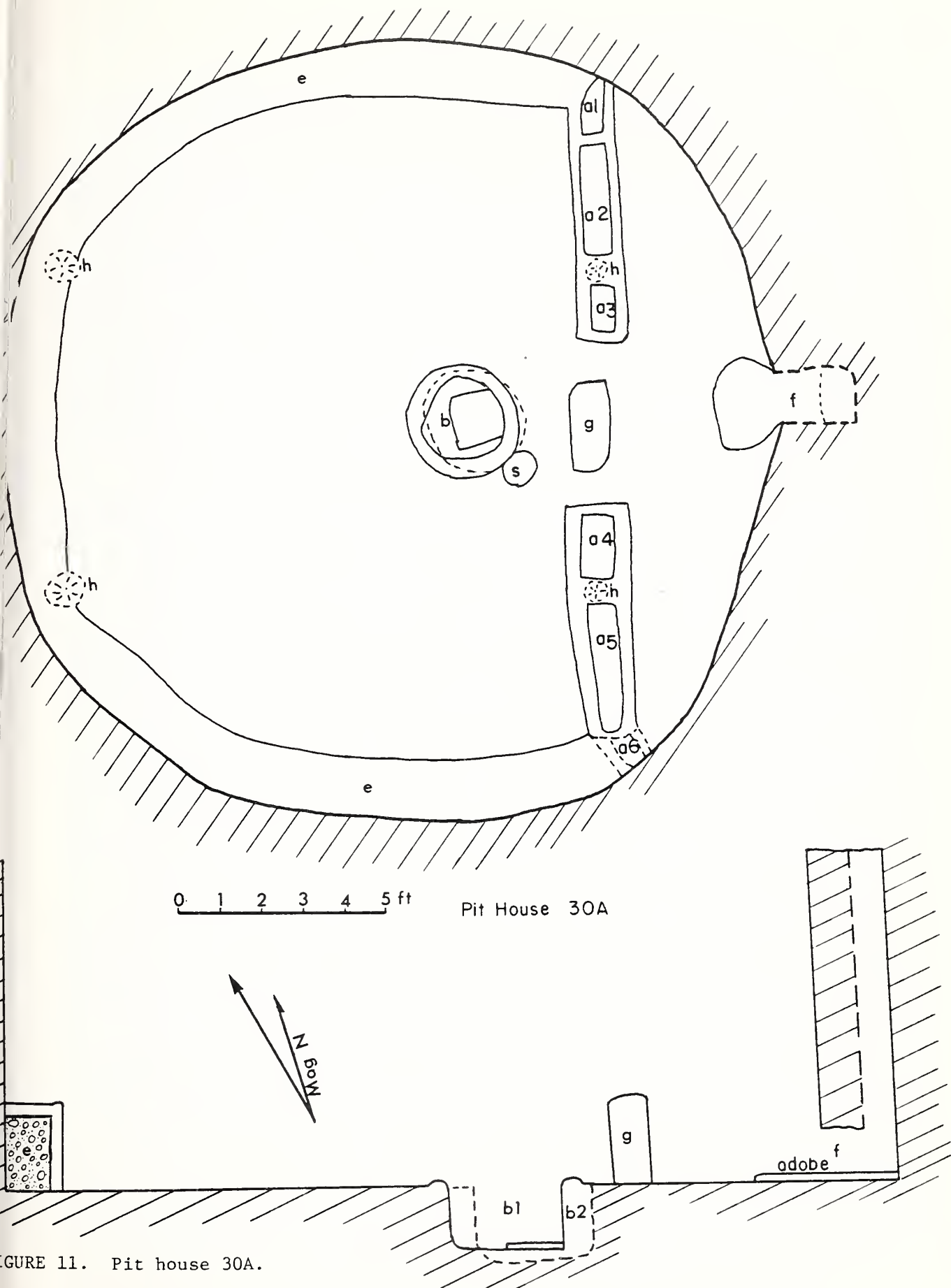


FIGURE 11. Pit house 30A.

Location. SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves
15 minute quadrangle.

Elevation. 7,120 feet

Date of excavation. June-July 1974

Condition. Fair, unburned, some collapse of bin walls.

Shape. Round pit house. North-south diameter 18.75 feet; east-west
diameter 18.8 feet.

Depth. 8.2 feet

Walls. Native soil plastered with adobe.

Plaster. Single, white, sandy layer.

Main floor. Unflagged. Blue clay 5 inches thick over weathered shale.

Anti-room floor. Unflagged adobe.

Banquette. Continuous from north to south bin. Constructed brown
adobe shell against native clay wall, core filled with yellow sand
and gravel. Slight lipping on outer edge. Width 1.3 feet, height
2.16 feet.

Main bins. North bin length 6.75 feet, width 1.16 feet, height 1.75 feet,
wall thickness 3 inches, three compartments: a1 length 1.4 feet,
width 5 inches; a2 length 2.65 feet, width 8 inches; a3 length 1.2
feet, width 8 inches. South bin length 5.5 feet, width 1.0 feet,
height 1.75 feet, wall thickness 4 inches. Two compartments:
a4 length 1.4 feet, width 10 inches; a5 length 3.1 feet, width 8 inches.

Banquette bins. Absent

Bin holes. a1 face main room, diameter 4-3/4 inches, height above
floor 2 inches; a2 none; a3 face anti-room, diameter 4-3/4 inches,
height above floor 2 inches; a4 face anti-room, diameter 3 $\frac{1}{2}$ inches,
height above floor 1 $\frac{1}{2}$ inches.

Deflector. Rectangular block. Length 2.25 feet, width 1.08 feet, height
2.08 feet.

Hearth. Round, unlined, remodeled, north-south diameter 1.92 feet,
east-west diameter 2.08 feet, depth 1.5 feet, collar width 4 $\frac{1}{2}$ inches,
height 3 inches. Distance from ventilator 5.24 feet. Earlier hearth
2 inches west, 3 inches below. Almost under latest.

Ash pit. Against southeast collar of hearth. Diameter 10 inches, depth
3 inches.

Ventilator. Located in east wall, elevated 3 inches above floor with
adobe platform extending 1.5 feet in front. Height 1.07 feet,
width 1.29 feet, length 1.84 feet.

Niches. c1 = diameter 3 $\frac{1}{2}$ inches, depth 3 $\frac{1}{2}$ inches, in banquette 1 foot
above floor.

Posts. Only casts of post remain. Northwest post diameter 6 $\frac{1}{2}$ inches,
depth 6 $\frac{1}{2}$ inches. Southwest post diameter 6 $\frac{1}{2}$ inches, depth 5 inches.

Southeast post diameter 5 inches, floor level. Northeast post diameter 5 inches, floor level.

Roof. No evidence remains.

AR-03-10-02-32 (Site 32) Pit House

The pit house is located on the northwest end of Huerfano Mesa, 50 feet west of the surface site 30. It is rectangular with broad, rounded corners. It was not burned and not in good condition.

An unusual feature was the narrow wall partition separating the anti-room from the main room on the east side. The southeast vertical roof support post was placed at the west end. A triangular bin formed the west partition. The fireplace was remodeled. The lower hearth was flagged over with its ashes still intact. The upper hearth was placed over the first (bl-b2). Hearth remodeling is not an uncommon practice. The floor was partially flagged. A large boulder in the northwest corner was pecked down to conform to both the wall and floor.

There are indications the west side of the house was reused. Six inches above the original floor was a packed floor containing a great deal of trash. The bench was 1 foot in width, narrower than usually encountered in either pit houses or surface houses.

Location. NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves 15 minute quadrangle.

Elevation. 7,120 feet

Date of excavation. Summers of 1972 and 1973.

Condition. Poor, badly eroded with only a few features remaining.

Shape. Rectangular pit house. North-south diameter 15.5 feet, east-west diameter 17 feet.

Depth. Highest point, north wall 5.3 feet, east wall 5.5 feet, south wall 5.5 feet, west wall 5.5 feet (average depth 5.5 feet).

Walls. Soil plastered with adobe.

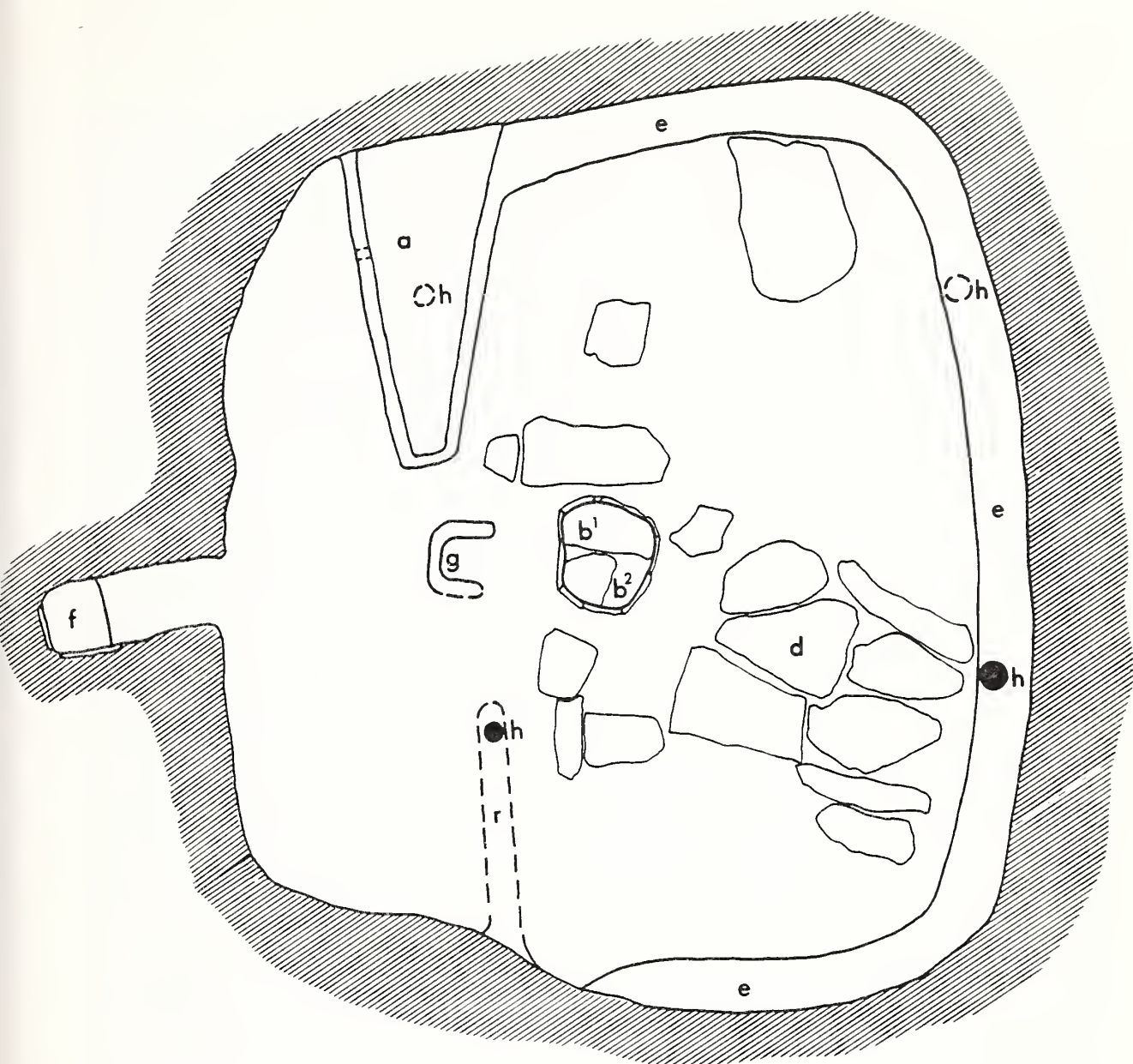
Plaster. Adobe in a number of layers (the exact number is unknown, but about five layers were thought to exist).

Main floor. Adobe layer, partially covered with flagstones.

Anti-room floor. Unflagged adobe layer.

Banquette. Complete from bin to partition. Average height 1.7 feet, average width 1 foot.

Main bin. A length 6 feet, depth 1.2 feet, width 2.5 feet, wall thickness 4 inches.



Pit House 32

0 1 2 3 4 5 ft.

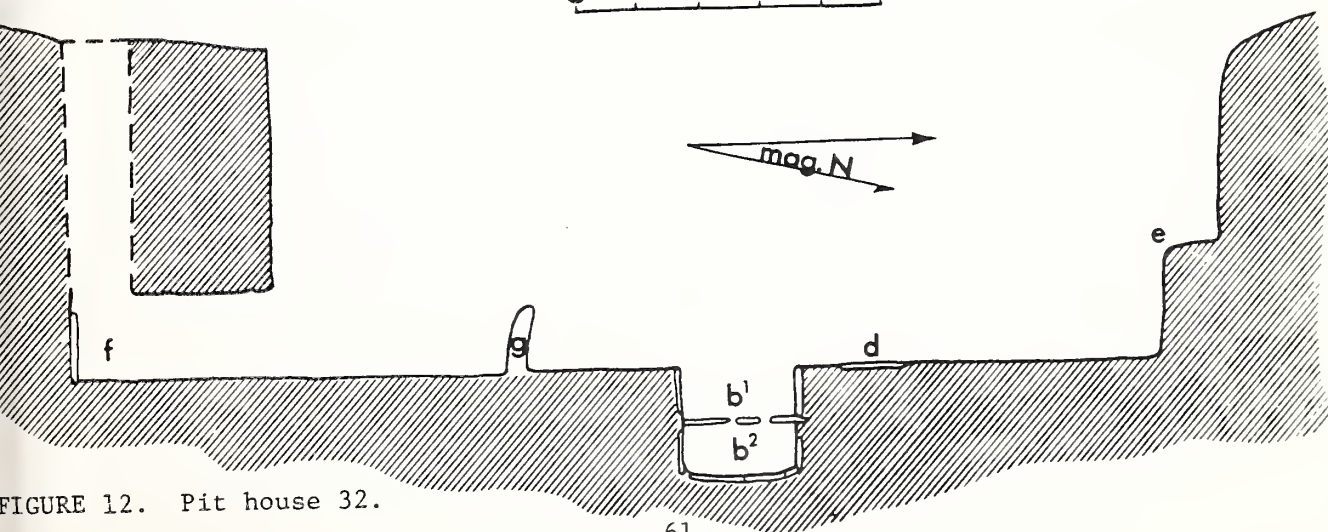


FIGURE 12. Pit house 32.

Banquette bins. Absent

Bin holes. One in bin a, faced anti-room and did not contain a plug.
a1 = diameter 5 inches, height above floor 3.5 inches.

Deflector. "U" shaped, south wall 1.4 feet, east wall 1.1 feet, height 1.2 feet, wall thickness 4 inches.

Hearth. Square to round and stone lined. North-south length 2 feet, east-west length 2 feet, depth of b1 1 foot, depth of b2 1 foot, distance from ventilator 6.5 feet.

Ventilator. Located in south part of room at the floor level, and stone lined. Height of opening to the room 1.5 feet, depth 3.5 feet, width 1.4 feet, outside opening unknown.

Niches. Absent

Posts. North posts in banquette: Northeast post diameter 5 inches, depth 9 inches; northwest post diameter 6 inches (?), depth 9 inches (?); southeast post in partition diameter 3.5 inches, depth 7 inches; southwest post in bin diameter 3 inches (?), depth 7 inches (?).

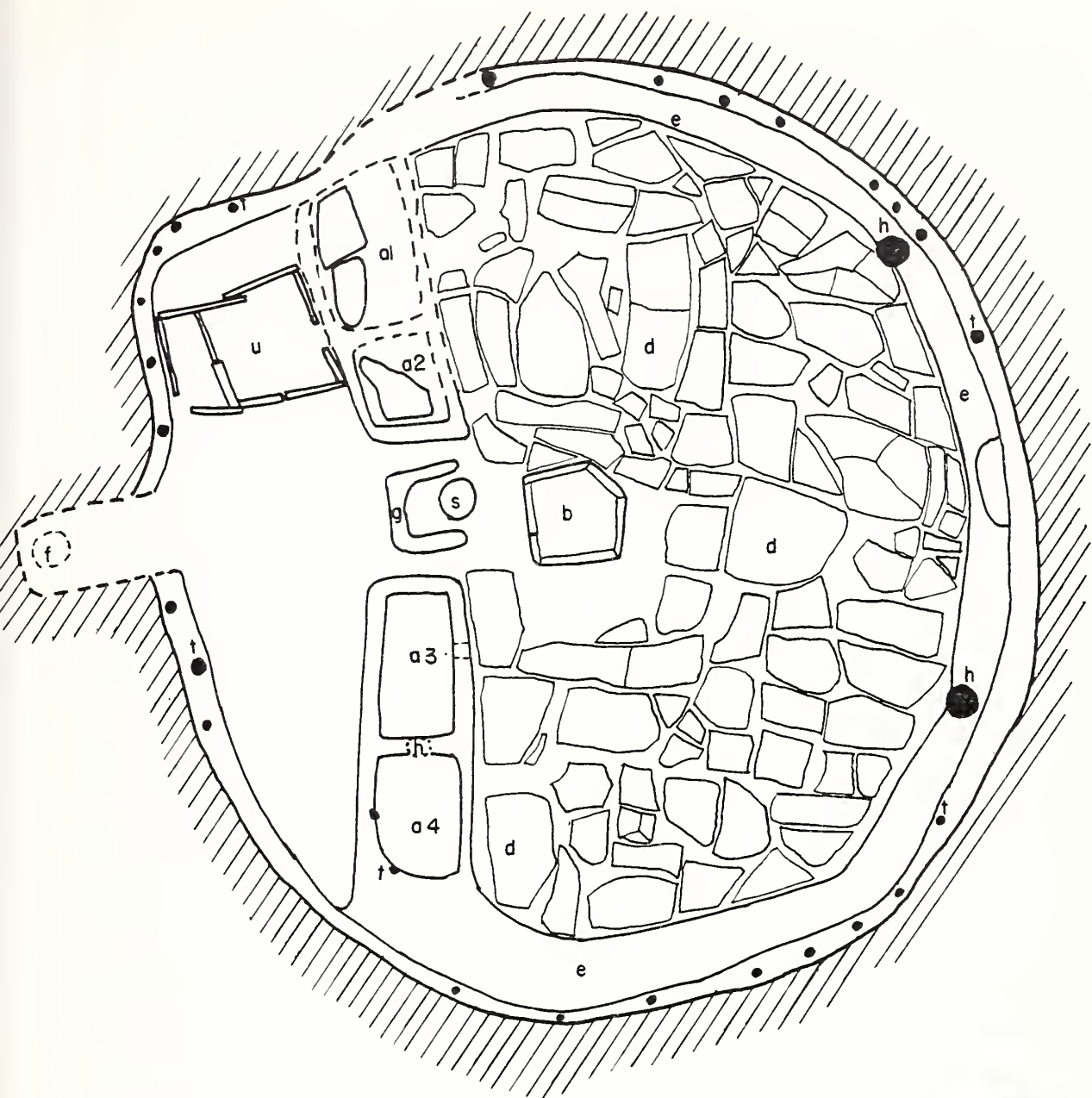
Roof. Unknown, apparently gone.

AR-03-10-02-63 (Site 63) Pit House

This round, unburned pit house proved to be 8 feet deep. It is located 32 feet south of surface 7 and 27 feet west of surface house 8. The structure was badly weathered after abandonment. The bins were mostly collapsed; the southwest and southeast vertical supports, that occur in the bin partitions, were missing. The living room floor was fully flagged but not as neatly as some surface houses.

The anti-room fill was particularly trashy a considerable distance above the floor. Perhaps the people in houses 7 and 8 used it to dump trash after its abandonment. The inside wall contained a number of wooden rebars covered with mud mortar. There is evidence of extensive shoring on the north wall with rock and mud. Water, it is conjectured, running down the north wall under the roof caused the damage.

Possible mealing bins (u) occur in the west end of the anti-room, tightly placed between the west bin and the south wall. No grinding implements were found in place. Several projectile points were found embedded in the north wall. We suspect some of the abandoned pit houses and surface houses, beside suffering dismantling, were destroyed by children's vandalism. We noted a number of boulders



Pit House 63

0 1 2 3 4 5ft.

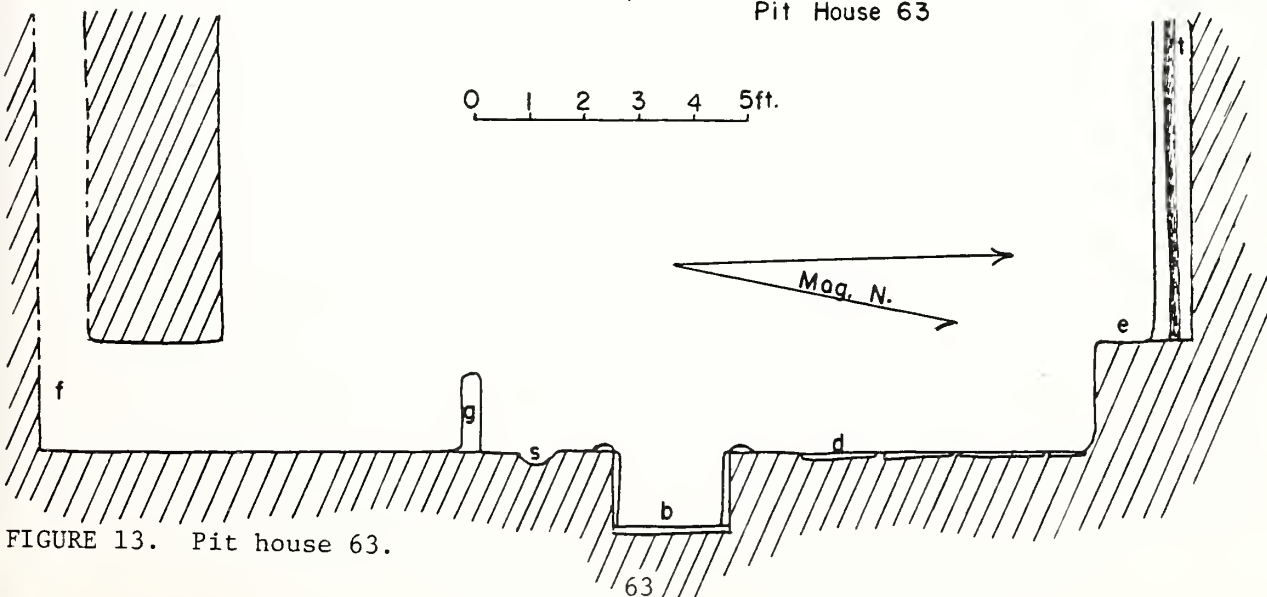
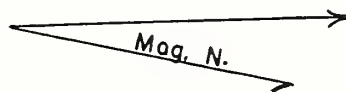


FIGURE 13. Pit house 63.

in and near the room bins as if they had been used to smash the bin walls. Firing arrows into the north wall could have been a form of target practice.

Location. NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 2, T. 25 N., R. 1 E., NMPM, Llaves
15 minute quadrangle.

Elevation. 7,120 feet.

Date of excavation. June-July 1974

Condition. Fair, some features badly weathered, unburned.

Shape. Round pit house, diameter east-west 20.0 feet, diameter north-south 18.2 feet.

Depth. 8.0 feet.

Walls. Native soil.

Plaster. Rough coat, four fine coats, sandy, light gray.

Main floor. Totally covered with flagstone.

Anti-room floor. Unflagged adobe layer.

Banquette. Excavated in native soil, uneven. West side width 1.5 feet, height 2.45 feet; east side width 1.21 feet, height 2.0 feet.

Main bins. West length 5.46 feet, width 2.07 feet, height (estimate) 2.45 feet; east length 7.19 feet, width 2.38 feet, height 2.0 feet.
Wall thickness 5 inches.

Banquette bins. None

Bin holes. a1 missing; a2 missing; a3 faces main room, diameter 5 inches, above floor 4 inches; a4 missing.

Deflector. "U" shaped. Length east-west 1.33 feet, width north-south 2.0 feet, height 1.33 feet. Wall thickness 4 inches. Stone slabs in floor. Distance from ventilator 4.5 feet.

Hearth. Pentagonal, stone slab lined. North-south 2.0 feet, east-west 1.92 feet, depth 1.58 feet. Collar height 3 inches, width 4 inches.

Ash pit. Front of deflector. Diameter 10 inches, depth 4 inches.

Ventilator. Located in south wall, width 1.7 feet, height 2.0 feet, length 3.0 feet.

Niches. None

Posts. In banquette, northwest post diameter 7 inches, northeast post diameter $6\frac{1}{2}$ inches, southwest post missing, southeast post missing.

Roof. No evidence remains.

Grinding bins. Southwest end of anti-room. Outline of stone slabs.

S1 length east-west 2.29 feet, width north-south 11 inches, depth $10\frac{1}{2}$ inches. S2 length east-west 2.17 feet, width north-south 2.29 feet, depth $10\frac{1}{2}$ inches.



POSTULATED STRUCTURE SEQUENCE

The Llaves area ruins date from the middle of the 11th century through the middle of the 13th century. The earliest tree ring date thus far found is A.D. 1059 (outside ring intact) from a building of the Rattlesnake Point group about 6 miles north of the Llaves post office. The latest date so far recorded is 1266 (outside rings missing) from Burriones Cliff House about 3 miles east of the Llaves post office.

Pit houses, possibly ancestral to the structures in the Llaves area, occur 36 miles northwest of Huerfano Mesa in the Gobernador drainage. The earliest tree ring date for that area is A.D. 791.

Below, the sites excavated in the Alkali Spring area are placed in an estimated chronology frame based on the general structural detail and some unverified tree ring dates. This is subject to change in the future.

Early A.D. 800	Intermediate A.D. 1033	Late A.D. 1266
X 30A (P)	X 2 (P)	X 1 (S)
	X 32 (P)	X 3 (P)
		X 4 (S)
		X 7 (S)
		X 8 (S)
		X 30 (S)
		X 33 (S)
		X 80 (S)

(P) Pit House
(S) Surface House

APPENDIX

DEVIANCE IN THE GALLINA:
A REPORT ON A SMALL SERIES OF
GALLINA HUMAN SKELETON REMAINS

By
James E. Chase

DEVIANCE IN THE GALLINA:
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James E. Chase
March 25, 1975

ACKNOWLEDGMENTS

I wish to take this opportunity to thank those but for whose assistance this report would not have been possible. First of all, to Dr. Herbert W. Dick, who stimulated interests, provided the guidance and counseling necessary to illuminate the dark, and who tolerated an unrelenting questioner. Secondly, to my wife for her incisive comments, typing and steadfastness. Thirdly, to those observers who came before who stimulated a fledgling's interest.

INTRODUCTION

This report concerns a small series of Gallina remains excavated during the 1972-1974 seasons by Adams State College of Alamosa, Colorado, under the supervision of Dr. Herbert W. Dick. During the course of these three seasons, remains of sixteen (16) individuals were found. The total number of individuals excavated from the Gallina now stands at approximately 56.

In the current series, all ages and both sexes are represented. Ages range from newborn to 50+ years. Considerable evidence of violence exists among the general population. Five remains were taken from excavations at Huerfano Mesa .5 mile east of Alkali Springs. Eleven individuals were taken from other excavations in the Llaves-Alkali Springs area and will be identified later in the report. All were buried in the late 12th or early 13th century, 1150-1250 A.D.

This report will cover burials, individual analysis, and a comparison with remains found by Earnest A. Hooten in the Pecos and with Frank C. Hibben and Charles H. Lange in the Gallina. Tables for all measurements taken of this series are attached as an addendum.

BURIALS

Portions of 16 individuals were recovered with 12 formally buried. Here burial is used to indicate placement of the individual in a purposeful manner that precludes accident.

Burial 1

Male, adult, 45+ years. Cat. No. G-8-138; site AR-03-10-02-08; location .5 mile east of Alkali Springs. Huerfano Mesa, T. R. NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$, Sec. 2, T. 25 N., R. 1 E., NMPM. Subfloor, rectangular surface house.

The burial was in a rectangular pit 2'9" long, 2'3" wide, and 3 feet deep in the southeast corner of the house in the alley-way south of the east bin. The pit was not filled after the interment but covered with small logs. Found associated with the burial were numerous pumpkin seeds (*curcurbita* sp?) and a large pottery sherd. These may have constituted a burial offering. The body was forced into the pit and rested in a tightly flexed position on the dorsal side along an east-west axis. The head was to the north while the head was twisted so that the face pointed east. Remains are in excellent condition.

This is the most complete individual to date excavated by Adams State, with only a few phlanges, meta carples and meta tarsels being absent. The individual exhibits the characteristic lambdoid flattening which has become a trademark of the Gallina population. The occipital is peculiar in that it is flat from the lambda to the inion then flat again to the foramen magnum. From norma veticalis there is left and right parietal deformation as well as a medium left occipital deformation.

Present is an old severe fracture of the right frontal. The fracture healed very well, but the point of impact can be determined. The point of impact is from the glabella, norma facialis, up 32.3 mm then left 19.6 mm. The fracture is traceable from the right lateral torus border to the bregma on a curved line with a total length of 135 mm. Neurological functions governed by the right frontal lobe must have been severely impaired if not curtailed. Osteoporosis is present, to a minimal degree, in the left parietal, occipital and frontal areas.

Teeth are worn below the nerve and present are seven caries, two of large size in the right lower molars. Several teeth, upper premolars, are decidedly rotten. Notable is the failure of the right upper third molar to erupt, and which is in the maxillary. All 2nd molars were lost ante mortum. Dentition of this individual is the worst of the series.

The right ulna has beginning arthritis on the coronoid process border. There is a calcium buildup in the glenoid cavity of the right scapula. The left humerus exhibits a pronounced bowing laterally. Both femora are slightly deformed in the area of the fovea capitis.

Many anomalies exist on the vertebral column and sacrum. The sacrum is arthritic on the dorsal side, and beginning arthritis is present on most of the vertebrae with it being severe on the third and fourth lumbar. A hairline fracture, unhealed, appears on the left lateral root of the arch of the eighth thoracic (T-8). Also present is a circular tumor on the left anterior body portion approximately 23.2 mm wide, 16.3 mm in height, and 10.0 mm in depth. Specific cause of this tumor is unknown. The inferior border of the thoracic vert. (T-7) immediately superior to the tumor is indented and accommodates the growing tumor on T-8. In articulation, T-8 is displaced 7.3 mm right and 4.7 mm rearward, which, in effect, forced the entire vertebral column above T-8 right and rearward.

Burial 2

Male, adult, 25 \pm 3 years. Cat. No. G-189; site AR-03-10-02-189; location .8 mile northwest of the Llaves Post Office at the base of a terrace on the south side of the Llegua Arroyo, SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 10, T. 25 N., R. 1 E., NMPM.

Remains were partially covered with talus and trash detritus, and the frontal bone was exposed. The grave was 20 feet below and 35 feet east of a surface and pit house site on top of the terrace.

Remains were disturbed but not in recent times. Conjecture is that the burial is a kill site with formal burial by the Indian, with possible post mortum mutilation because no hands or feet were found. Remains are in good condition; however, the frontal and right parietal are in fair condition due to weathering. The individual was flexed and placed on the dorsal side in a small bedrock crevice with the head facing to the north.

Only three lumbar vertebrae were present; no other vertebrae were present. No funerary offerings were in association with this individual. A serrated projectile point was found in the pelvic cavity. Impact of the point may have been a contributing cause of death.

He exhibits lambdoid flattening while the inion is hook shaped. Medium osteoporosis in the occipital, both parietals and the frontal are present. The lambdoid suture is complex in construction. Present is a secondary lambdoid suture superior to the normal one enclosing a wormian.

Only one parietal foramen is present and that is located in the right parietal. Where the parietal foramina should be are numerous secondary pits with most being on the left parietal. It is felt that these are not the result of osteoporosis. From norma veticalis is a severe deformation of the left occipital and right parietal.

Teeth are crowded somewhat, exhibit medium wear and a faulty eruption, laterally, of the right upper third molar. The individual possesses a severe over bite.

Calcium is built up in the glenoid cavity of the right scapula while the left humerus possesses a perforated olecranon fossa and the right ulna indicates an old, well-healed fracture below the radial notch.

The vertebrae present indicate no arthritis; however, the sacrum has the beginning disease. The sacrum is incompletely fused anteriorly with segments being separated by one to two mm while fusion is complete laterally and dorsally. Norma faciales provides a view of the vomer and ethmoid plate being deviated to the right (to the left of the individual).

Burial 3

Sex undetermined, child 9 years \pm 9 months. Cat. No. G-3-7; site AR-03-10-02-03; location Huerfano Mesa, .5 mile east of Alkali Springs, SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$, Sec. 2, T. 25 N., R. 1 E., NMPM.

The child was buried in an artificial rock pile 6-8 feet west of a burned, rectangular pit house. Burial was earth-filled and covered by a large sandstone slab. The child, tightly flexed, was placed on the right side with the head to the north, the face to the west. No tibias were present, and the femora were reversed from their normal flexed position.

There are several ways in which this may have occurred. First, the burial may have been disturbed; second, the body may have been first buried then dug up and reburied by the Indians. However, no evidence

for either exists. Third, the child could have been dismembered by the Indians themselves and then interred.

Evidence supports the third hypothesis as there is present, on the popliteal surface of the right femur, numerous striations caused by a primitive cutting instrument, probably a thin flint knife. Under microscopic examination, striations become more numerous and better defined with bases being rounded and irregular. Striations present are filled with soil, and there is little doubt that these were caused before burial and while the bone was green. This is also supported by the absence of tibias and the femora reversal. The child exhibits lambdoid flattening and a pronounced deformation of both parietals. Medium osteoporosis is present, and both olecranon fossa are perforated.

Burial 4

4-A: Female, adult, 22 years; 4-B: Male, adult, age undetermined. Cat. Nos. G-81A, G-81B; site AR-03-10-02-81; location first terrace on the north side of the Chupadero Spring Arroyo, .25 mile north of the old Chupadero Camp Ranger Station. This is the site of Dr. Mera's early excavations.

The site has a complex history and was badly vandalized. It is a 12-foot high circular building built on a base of bedrock boulders, and I conjecture it was a grainery. There are evidences of large contiguous boulder bins. The structure was originally burned, cleaned out and reoccupied. Two individuals were buried together on the west side under a foundation boulder during the second occupation. Further, the bones were disturbed.

The female, 4-A, suffered a severe blow to the left side of the head causing a separation of the coronal suture which had not begun to heal and, consequently, was a contributing factor in her death. The male, 4-B, has a small side-notch projectile point still embedded in the lateral, proximal end of the left tibia (knee). Of the two individuals, the female is the most complete. The lower extremities, the atlas vertebrae, several ribs, and fragments of the cranium of the male were the only portions present.

The female (4-A) exhibits the characteristic lambdoid flattening and the same hooklike union of the male in burial 2. She possesses five wormians; and there are, as in burial #2, numerous secondary pits

in the left parietal in the vicinity of the parietal foramen. These are not the result of severe osteoporosis also present in this individual.

From norma verticalis is a slight left occipital deformation and simple suture construction. From norma facialis there are no supra orbital foramina, and both infra orbital foramina are exceedingly well developed and pronounced. From norma facialis appears a well healed facial fracture. Point of impact is 25.0 mm superior to the glabella at a point where the frontal has been artificially modified to a depth of 3.0 mm after being struck by a blunt instrument. From the point of impact, the fracture descends through the glabella to a point 2.0 mm right (norma facialis) of the nasion (left side of individual) where it intersects the nasal suture.

From left norma lateralis another fracture, unhealed, is apparent. This one is unusually severe and the probable cause of death. The point of impact is from the bregma, along the coronal suture, down 42.1 mm. The blow forced a separation of the coronal suture. There is evidence of spallation both interiorly and externally at the point of impact.

The left fibula is fractured and unhealed 55.0 mm below the head. The left humerus has a perforated olecranon fossa. One can only surmise that this female died of violent causes as did her companion, a male.

Sexing of 4-B, a male, was done by comparing muscle attachments, size of bones, etc., of the available bones with those of other males of the same population. Two bones, in particular, exhibit peculiar anomalies. The left femur exhibits pronounced bowing anteriorly and striations caused by a sharp instrument 15 mm superior to the adductor tubercle on the popliteal surface.

A side notched projectile point, of chalcedony, is embedded in the posterior portion of the lateral condyle of the left tibia, just below the male's knee and barely cleared the fibular articular capsule. Emplacement of the projectile suggests that the male was struck from his left side, from a slightly superior position and from short range.

Burial 5

Male, adult, 32-35 years. Cat. No. G-4-52; site AR-03-10-02-04; location Huerfano Mesa, .5 mile east of Alkali Springs, $SE\frac{1}{4}NW\frac{1}{4}$, Sec. 2, T. 25 N., R. 1 E., NMPM. Fill, scattered, rectangular, surface house.

A calvarium, the right femur, and the right tibia were found. Parts were in the fill 3 feet above the floor near the west wall inside the house. The calvarium was found in the stratigraphic column in the northeast corner of the house; the femur and tibia were found along the west wall. Although the head was oriented north, there are no indications that it had been buried in this position.

This male is the largest boned person excavated. The long bones are extremely thick, heavy, and massive in construction, not size.

The characteristic lambdoid flattening is present with the lambdoid suture being complex in structure. Medium osteoporosis is present. One parietal foramen is present, on the right side. From norma verticalis is a severe right occipital deformation and a medium right parietal deformation. From norma facialis, there are no supra orbital foramina and the vomer deviates toward the left parietal.

Striations appear on the popliteal surface of the femur near the adductor tubercle and on the posterior portion of the proximal end of the tibia. They are not the result of natural or root action.

Burial 6

Sex undetermined, adult, age undetermined. Cat. No. G-2; site AR-03-10-02-02; location Huerfano Mesa, .5 mile east of Alkali Springs, west bin floor of deep circular pit house, $SW\frac{1}{4}NW\frac{1}{4}$, Sec. 2, T. 25 N., R. 1 E., NMPM.

Remains consist of four articulated lumbar vertebrae, several carpals and phalanges. The vertebrae exhibit extreme arthritic lipping of the edges. Vertebrae were placed on their dorsal side oriented on an east-west axis and, when uncovered, were in perfect articulation, thus indicating emplacement while green. This individual is an adult and one placed in the old age group with justification on the basis of the severe arthritic lipping, spines up to .5 cm long.

Burial 7

Sex undetermined, adult, age undetermined. Cat. No. G-80; site AR-03-10-02-80; location first terrace on the north side of the Chupadero Spring Arroyo, .25 mile north of the old Chupadero Camp Ranger Station, NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 4, T. 25 N., R. 1 E., NMPM.

House, surface, rectangular with rounded corners, thoroughly burned and three-fourths vandalized.

Remains consist of the left side of a mandible and a fragment of the left ascending ramus found beside and 6" below the banquette on the east side of the house. Full eruption of the teeth is indicated by the portion of the mandible present. This is the only burned individual excavated. The mandible is carbonized to a depth of 1/16 of an inch with the ascending ramus charred the worst. No other anomalies were observed.

Burial 8

Sex undetermined, child, age 9 months. Cat. No. G-31 B; site AR-03-10-02-31; location west edge of Huerfano Mesa, .5 mile east of Alkali Springs, NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$, Sec. 2, T. 25 N., R. 1 E., NMPM.

Intentional burial found on north side of large boulder at southwest corner of bins belonging to a pit house to the east. Burial was 25 feet west of the pit house center.

The cranium was oriented south, with the face toward north. Some post burial disturbance indicated. Structure designated a grainery or turkey pen due to presence of grain and egg shells. Child is not complete. The lambdoid flattening is present, and no other anomalies were observed.

Burial 9

Sex undetermined, child, age 4 years \pm 9 months. Cat. No. G-3-35; site AR-03-10-02-03; location Huerfano Mesa, .5 mile east of Alkali Springs, SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$, Sec. 2, T. 25 N., R. 1 E., NMPM. Burial in rock pile 6-8 feet west of rectangular pit house, site 03.

Remains consist of a calvarium and several ribs. The calvarium was face down, and the ribs were found 3 feet to the northeast of the calvarium.

The child has the lambdoid flattening and four wormians; no other anomalies observed.

Burial 10

Female, adolescent, 15 years. Infant newborn. No catalog or site number. Sec. 29, T. 25 N., R. 1 E., NMPM. Location, NW $\frac{1}{4}$, Sec. 29, 2 miles east of Llaves. Shallow surface grave contiguous to large pit house.

The burial, badly disturbed, was in a shallow grave 15 feet west of a large, 25-foot diameter, pit house situated on a low terrace above the valley floor. A subsurface soil ripper has passed through the grave strewn the body but not destroying the skull, lower long bones, or original orientation. Found associated with the burial were numerous potsherds, cores, flakes and curiously shaped human bone 22.2 mm long, 9 mm wide, 2-5 mm thick, rounded on the ends, ground flat on the long sides with one surface original bone with other flat and smooth. The flat, smooth surface and long sides have been modified to be as they are. They could not have occurred naturally. All may have constituted a funerary offering. The body was placed with the head to the north. Remains are in good condition with the skull in excellent shape.

All long bones, with the exception of the left ulna and right radius, are represented. Portions of the pelvis remain as do carpels and tarsels. Present also is a portion of a child's innominate. The female exhibits the characteristic Gallina lambdoid flattening.

Norma verticalis indicates deformation of both parietals and the occipital. Present on the left parietal is a ruler straight lateral indentation 74.2 mm long, 3.2 mm wide, and 2 mm deep, which is located at a point on the parietal where a clear change in bone plane occurs. Along the line are minute ripples in the bone that parallel the mark. Ripples are present on the right parietal at the point of plane change, while the mark is not. The indentation begins as the sagittal suture, proceeds laterally toward the left side and descends paralleling the lambdoid suture. There is also a rectangular depression on the sagittal suture 10 mm long, 14.6 mm wide, and 2 mm deep, which is 27.8 mm superior to the lambda. From this point through the lambda to the inion is a straight depression trough approximately 14 mm wide. At the point of the sagittal rectangular depression, there is, on the inside of the skull, a slight inversion.

Coronal, sagittal and lambdoid sutures are simple. Nuchal crest is very well developed and present are four wormians. Unusual is the presence of a right small epipteric bone on the right side.

Norma facialis gives a view of a bulbous, neotanus skull with a very high forehead and pronounced frontal tuberosities. The cranium is gracile in all aspects. There are slight depressions in the frontal immediately superior to the lateral border of the orbits. The left orbit is deformed, superior interior, lateral surface, with a pit 10.9 mm wide, 24 mm long, 2 mm deep, and roughly rectangular in shape. The skull is round from N. basilaris. Both occipital condyles have one large fovea in the center of each.

Because of the presence of an infant's innominate and no other anomalies, cause of death is attributed to child birth.

Burial 11

Male, adult, 50+. Child, less than 2 years. Cat. No. G-38-1; site AR-03-10-02-38; location .25 mile southwest of Alkali Springs on the ridge immediately above cattle guard, Sec. 3, T. 25 N., R. 1 E., NMPM. Bin, northeast corner, rectangular, surface house.

The male burial was originally placed in a banquette bin in the northeast corner of the house. Other data relating to placement of body could not be determined as the site was vandalized by a pot hunter utilizing dynamite. No bone is unmarked by the vandal's pick or dynamite. The left side of the individual is well represented and easily measured. However, other measurements and observations were taken and made where possible.

The skull is missing, and no part is present except mandibular heads. The calvarium presumably accompanied the pot hunter. Two teeth, both incisors, well worn, are present. All vertebrae present indicate severe arthritis with many at the point of fusion. There are no lumbar vertebrae present. The sacrum possess severe arthritis changes.

The lower long bones are fairly complete with only portions of the left fibula being absent.

The left femur is bowed anteriorly, the left tibia straight. The left shows evidence of an old partial fracture, middle of the shaft, medial

side, which may have caused the shaft to straighten unnaturally. Tibias are fairly uniform; however, the fibulas are not. The left fibula is as it should be, but the right is severely bowed medially and rests against the tibia. The right fibula was fractured at a point 110 mm superior to the distal end. As in the femoral fracture, there was no displacement of bone and has healed. Both fibula and femoral fractures probably occurred at the same time.

Stature, using all left side long bones, is 160.36 cm.

Found associated with the burial were numerous bird bones. No other anomalies were observed.

Also taken from this site was a child's ulna and a portion of the maxillary. Remains are too fragmentary to comment further.

Burial 12

Female, adult, 25-35 years. Child, sex undetermined. Remains fragmentary. No catalog or site number; location 1.9 miles south of Alkali Springs, 6 feet from road, in valley floor. Sec. 10, T. 25 N., R. 1 E., NMPM. West side of Capulin Creek.

Remains partially covered with soil, femora and parietal exposed. Grave was 30 feet northeast of probable pit house. Area has been plowed by soil ripper. Associated with the burial were potsherds and a round sandstone concretion.

As stated, female remains were disturbed by plowing; however, it was possible to determine the axis of burial as the vertebral column had not been displaced by the plow. Original placement for the female was on the dorsal side flexed with the head north. Flexing was determined by the presence of an articulated calcaneus and astragalus next to the left femoral head and ilium also articulated. A child's ulna and sacrum were found here also and indicate burial between or near the female's feet.

Severe arthritic lipping is present on the sacrum of the female. No other arthritic anomaly noted.

Striations appear on the anterior distal end of the left femur. These are of the same nature and structure as those found on burial #3. The proximal end of the ulna is hollowed out and smoothed on the inside. The modified ulna length is 12.75 cm.

The skull, which is only partially preserved, consists of the right parietal, temporal and portions of the occipital and left parietal. The remains suggest that death was the result of being struck with a blunt instrument, such as the Gallina ax. The blow was of sufficient force to completely shatter the parietal. Point of impact was from the bregma 102.5 mm, from the lambda 90.0 mm, and directly above the auditory meatus at a point where lambdoid deformation begins. At the point of impact is a beveled hole approximately 1 cm in diameter with fractures radiating in all directions. There is spallation on the interior and exterior of the skull at this point. Internal and external radiating fractures do not, in all cases, coincide. The bone was completely separated along two fractured lines, one descending from and one rearward of the point of impact. There are five external and six internal major fractures of the parietal with the longest external at 75 mm and the longest internal 71 mm curve distance. With the exception of the two complete fractures, all others are .25 - .5 mm from being complete. Separation fractures are inferior to point of impact while interior fractures are predominately superior to point of impact. Coronal, sagittal and lambdoid sutures precluded further fracturing of the skull. There is no evidence of any healing along fracture lines; therefore, the blow to the head, probably from the right rear, is considered the cause of death.

It is assumed the child died at the same time. No anomalies were observed for the child.

SUMMARY OF BURIALS

From available data, certain conclusions are drawn. With intentional interment, particularly with adults, some effort was made to orient the cranium toward the north, with the axis of the body being of secondary importance. Those intentionally interred are predominately fixed although there are indications of forcing a body into an available space. There is occasional deviance from the Southwest Indian practice of burying individuals in easily excavated locations; i. e., trash heaps, No. 1 was buried in native earth in the anti-room (south) of the house. Burials either whole or partial, inside house, tend to be in bins with others under the floor. Of the burials in this series 25% are multiple. Burials occurring outside the house have not been found more than 40 feet from the structure, nor have any burials been found south of a house. It is as if the south is avoided, at least for burial. Funerary offerings are present, with indications of

offerings found in burials No. 1, 10, 11, and 12 of seeds, potsherds, bird bones, concretions, and a modified human bone.

Evidence of dismemberment prior to burial exists as no burial is 100% complete. The tarsels and carples are most often missing with tibias and lumbar vertebrae next. There are definite cutting striations of two burials (Nos. 3 and 12) and numerous suspicious marks on others. Most of these striations occur near or on the popliteal surface of the femur; however, an unusual modification occurred with the ulna of burial 12. Further indication of dismemberment is provided by the many isolated bones; for example, the four lumbar vertebrae found in burial 6, as well as many carples and tarsels strewn about the houses and missing from burials. Some individuals were burned either accidentally or on purpose. This is supported by the presence of a charred mandible in burial 7.

All individuals in this series exhibit a characteristic lambdoid flattening with a deformed occipital or parietals. Most have varying amounts of osteoporosis. Elder individuals exhibit severe arthritis, particularly on the vertebrae, while the young have the beginning disease. A number have secondary pitting of the parietals, most often the left, while several have only one parietal foramen which occurs in the right parietal.

Of seven fractures observed, four could only have been as the result of being struck by something blunt, wielded by someone. It is unlikely that a frontal or parietal fracture of the type seen would be caused by a fall as a femoral or fibular fracture could have. This alone is ample justification for a conclusion of hostile or violent cause; but the two projectile points, one in the pelvic cavity of No. 2 and one embedded in the tibia of 4-B, are conclusive. Ample evidence, therefore, does exist for a conclusion of altercations between individual households, clans, villages, or with some outside group.

In this series, death occurred in the following percentages: age group 45+, 3 or 19%; 30-35, 2 or 13%; 22-25, 4 or 25%; 15-20, 1 or 6%; under 10, 6 or 38%. Of those sexed, males outnumbered females five to three.

Violence was evident in 38% of the total population studied and 60% of the adults. Of those definitely sexed as male (five), three exhibit evidence of violence for a 60 percentile. Two identifiable females were killed by severe blows to the head. Violence was

the way of life for this population in the Gallina. Data suggest most died in childhood or in early adulthood and rarely lived to surpass the age of 45.

Dentition remained of good quality even with subsequent severe wearing caused by ingesting sand from the metate used in grinding corn. Caries were found in two individuals' teeth with most in an aged male of 45+. No dental abscesses were found. Pyorrhea is present to a small degree in one male and pronounced in another. There is ample room for the teeth with crowding being present in two individuals of medium and pronounced degrees. Tooth eruption is complete in all but the children, one adult, an elder male (1) with incomplete eruption of the right upper third molar and one female (10) with no M3 eruption. Shovel shaped incisors are present in all who had incisors suitable for analysis. The bite for all is proper with the exception of one male (2) and one child (3) who possess severe over-bites.

Generalizations for crania include the following: Shape of the orbits are predominately rhomboid with inclination being most pronounced for the right. Malars are medium to large in the male and small in the female. Lateral malar projection is medium in males and females. Zygomatic processes are large to medium in the male and small to medium in the female. Of special interest is that all pterion are H-shaped; and, in addition, one female has a small epipteric bone on the right side.

Nasal depression is medium for the males and pronounced for females. Nasal root height is low to medium in all adults. Nasal root breadth is pronounced in both sexes and bridge height is high. Nasal bridge breadth is medium to pronounced. Nasal profile is concave for all. Nasal aspects contributed to a rather flat, wide face. Mid-facial prognathism is slight to none, alveolar prognathism none to slight and medium in one male (5). Total prognathism is none to slight with No. 5 again being medium.

Alveolar border preservation is fair to good and absorption slight with 45-year-old male being medium. Palate shape is without exception parabolic with height medium to very, very high.

Brow ridges range from divided to continuous and the degree, small to medium. Forehead slope is none to slight, and post orbital constriction is medium with medium gabling. Mastoid processes

are pronounced in two males, medium in another, and small in the females. Precoronal depression is evident in two individuals.

Adult cranial indices indicate all males and one female are hyperbrachycranic and the other female is brachycranic. The height-length index indicates all are hypsicranic (high skull). The height-length index for No. 2 was, of necessity, taken from the porion. Height-breadth male index indicates two are tapeinocranic (low skull), one is metriocranic (medium), and that both females are acrocranic (high). Mean-height: one male is mesosemic (medium skull), and one male and both females are megasemic (high skull). The frontoparietal indicates that all, including the immature individuals, are eurymetopic or broad-foreheaded.

All have narrow foramen magnums (microsemic). The facial index is mesoprosopic or midfaced for all. Superofacial values indicate all except one male are mesene (med-faced). One male (5) is classed as a leptene (narrow) faced individual. Orbital indices vary for the left orbit. One male, both females, and two juveniles were hypsiconchic (high orbit), while the other two males are mesoconchic (medium orbit). The right orbit is more consistent in that all are hypsiconchic except one male who is mesoconchic.

Nasal indices are varied depending upon the system used. If Bronca's classifications and values are used, the following results: two males leptorrhine (narrow nose), one male, one juvenile and one female mesorrhine (medium nose), and a female and one juvenile as platyrrhine (broad nosed). If Martin's system is used, three males are mesorrhine (medium nose), both females and two children are chamaerrhine (broad nosed). The maxilloalveolar index indicates that all are brachyuranic (broad jaw). All have a broad palate (brachystaphyline). There is little prognathism as all are orthognathous.

Gallina individuals in this series are short, averaging for the males 157.898 cm and the females at 150.79 cm. The tallest male is 160.78 cm, the shortest 152.88 cm. Heights were determined using Pearson's 1898 formula.

Cranial tendencies are hyperbrachycranic, being high in relation to its length, low to medium height to breadth for the males and high for females. They tend to be broad-foreheaded and medium faced. Left orbits are medium to high while the right is high. Using Martin's nasal characteristics, the males are narrow-nosed, the

females broad-nosed. The people are broad-jawed, high palated, and exhibit little prognathism.

By now, the reader should be totally confused as to the meaning of pronounced-medium and slight or small. As an introduction to other investigators, I offer a quote by Hooten made when discussing his average male European.

. . . Taking this hypothetical average male European as a standard, I grade features on the following scale: absent, small or sub-medium, medium, large or pronounced, and very pronounced Of course, sets of observations made by different observers are not strictly comparable. However unsatisfactory one may consider such qualitative observation, he must admit that they are better than nothing at all. They lend themselves to a measure of statistical treatment and are certainly superior to the vague and general descriptions of "skull types" which many craniologists append to their metrical studies.^{1/}

It is the opinion of this observer that relative morphological pronouncements are worthwhile within a given population only and not as a primary means of comparing completely different populations. What is pronounced in one population may be small in another. With this as a base, I will discuss what others have found to be true of the Gallina.

Most Gallina skeletal material, 38 individuals, was found by Dr. Frank C. Hibben during his 1937-1938-1939 excavations. His data is based primarily on 13 individuals. Of the whole, 12 were cremated rendering measurement impossible, seven were immature, five were crania only, and one of the remaining 14 was badly broken, thus leaving 13 which were excellent for measurement.^{2/}

Hibben states the following as being characteristic of the Gallina and believes there is little differentiation between adult male and female

^{1/} Frank C. Hibben, The Gallina Culture of North Central New Mexico; unpublished Doctor's dissertation (Department of Anthropology, Harvard University, Cambridge, 1939), p. 261.

^{2/} Ibid, p. 262.

crania. Hibben adds, male mastoids are but little larger than the female, both being recorded as medium in most cases, and supra orbital development is quite small in males and females. In other respects, he believes that the sexes were of such similarity that the following would characterize the "typical" Gallina, male or female.

Medium mastoid, weakly developed superorbital ridges; Ovoid crania from norma verticalis, brachycranial, pronounced lambdoid flattening, curvature of occipital region, traces of metopism, large parietal bosses, ridge shaped occipital tori, general simplicity of sutures (mainly open except for five individuals with advanced occlusion); pterion forms in K, concavo-convex nasal profile, leptorrhine; very high and parabolic-shaped palate; absence of palatine and mandibular tori, median chin form, alveolar prognathism, shovel-shaped incisors; psalidonte, absence of accessory cusps and supernumerary dentition, and complete eruption.^{3/}

He further states that the most outstanding feature of the Gallina series is its uniformity. He estimated stature using Pearson's formula using five individuals, two females and three males. He provides an average height for males at 160.148 cm and females at 150.789 cm.^{4/} Also stated is that immature crania hold characteristics in common with the adult; for example, "lambdoid flattening, wide-low nasal bones, concavo-convex nasal profiles, square orbits, high palates and alveolar prognathism. Also two large Inca bones were found in the immature but none in the adult."^{5/}

Dr. Charles H. Lange, in his excavation of the Evans Site, found a single individual, an old woman. He states that she was buried in the northern portion of the house in two banquette bins. He believes she was forced into the bins. Her skull was in one bin and the remainder in another. There were no funerary offerings, and she was missing her hands and feet as well as the mandible. He further

^{3/} Ibid, pp. 256-257

^{4/} Ibid, pp. 264-265

^{5/} Ibid, p. 256

states that she showed no evidence of violence. He also believes that the woman closely resembles the general traits professed by Hibben as being typical.^{6/}

Ms. Natalie Pattison, in her analysis of Hibben's Nogales Cliff House burials, states that the body was most often flexed, usually on the left side with the head oriented west. Furthermore, funerary offerings were present, but not common. Implied, because of the many burials in a specific location, a single southern room, is the existence of a cemetery. She lists the same general physical characteristics as did Hibben in 1940. Of the 20 individuals interred, six were female, four male, and 10 questionable. Of the nine intentional burials, six were flexed. She states that seven individuals were victims of a massacre with no criteria for selection to this category. In the same breath, she states that only one individual shows evidence of a frontal fracture with an ax. Funerary material is associated with four individuals, three women and one of questionable sex.^{7/}

Pattison and Lange list exceptions to the typical Gallina, she in 1968, he in 1940, both of whom parroted data from Hibben's report of 1940. These are provided for reader comparison with present series.

PATTISON:

Bg 3 60/1 - long inferior spines on the internal pterygoid plates.

Bg 3 60/2 - one accessory cusp UPM₂.

Bg 3 60/3 - advanced occlusion of sutures and a pronounced sulcus along the posterior portion of the sagittal suture, six lumbar vertebrae present.

Bg 3 60/12- Precoronal depression

Bg 3 60/16- URM₃ not erupted

^{6/} Charles H. Lange, Jr., The Evans Site: A Contribution to the Archaeology of the Gallina Region, Northern New Mexico; Thesis for M.A. (University of New Mexico, 1941), p. 61.

^{7/} Natalie Batchelder Pattison, Nogales Cliff House: A Largo-Gallina Site, Thesis for M.A. (University of New Mexico, January 1968)

Bg 3 60/4 - third rib and clavicle broken and healed

Bg 3 60/5 - pronounced lipping of semi-lunar notch of left ulna
and on distal ends of the left humerus and radius.^{8/}

Lange's observations for specimens of unusual interests indicate that dentition is uniform, that there are no supernumerary teeth, and that only one accessory cusp was found on the ULPM₂ of Bg 3 60/2.

Additionally, he states:

Bg 5 60/2 - No erupted 3rd molar and ULM₃ was not indicated in the maxillary, female 25-35. This individual also had abscesses of the canine and two pre-molars of the right maxillary.

Bg 3 60/1 - Abscesses on the left mandibular notch and no condyle on the left ramus.

Bg 3 60/1 - Pronounced sulcus posterior portion of sagittal suture,
and 60/3 2 cm wide, 5 cm depth.

Bg 3 60/4 - Large abscess right temporal between the mastoid and auditory meatus.

Bg 3 60/7 - Possible evidence, left frontal and orbit split by what appears to be an ax blow. No other crania yielded any similar evidence although arrowheads were found in charred flesh and Cuchillo.

Bg 3 60/12 - Precoronal depression while in others post-coronal depression absent or very slight.^{9/}

The above excavation numbering for Pattison, Lange and Hibben may be confusing; consequently, the following is provided to clarify where skeletal material was obtained. Material from Cuchillo is designated Bg 2 60/1 - 16; from Nogales Bg 3 60/1 - 18; Gavilan Bg 4 60/1 - 2; and Tapeचितoes Bg 5 60/1 - 2.^{10/}

^{8/} Ibid

^{9/} Charles H. Lange, Jr., New Mexico Anthropologist: "A Brief Summary of a Cranial Series from North Central New Mexico." Jan.-Feb.-Mar., 1940, Vol. IV, No. 1 (Department of Anthropology, University of Mexico, pp. 14-15)

^{10/} Ibid, p. 13

With this, it's time to turn to Hibben's tables published in 1940. The writer will spare the reader a blow-by-blow analysis of the tables and will only extract data considered germane and comparable. We begin with the crania.

Hibben's uncorrected Gallina adult cranial mean is 88.44, frequency 9; total facial 85.75, frequency 4; superofacial 53.00, frequency 5; nasal 45.80; frequency 10; left orbital 92.50, frequency 6; external palatal (maxilloalveolar) 122.17, frequency 12; mean diameter of foramen magnum 30.00, frequency 12.

Indices for definitely sexed males are based on a frequency of 4 to 5 individuals definitely classed: cranial 88.64, total facial 86.25, superofacial 53.98, nasal 46.64, left orbital 94.91, and the external palatal 120.35. For definite females: cranial 88.51, total facial 86.70, superofacial 51.02, nasal 47.23, left orbital 91.74, and the external palatal 118.71.^{11/} Indices were not available for the Lange individual.

Data obtained by Adams State differs from Hibbens in the mean for five adult individuals and is as follows: cranial 90.00, total facial 86.08, superofacial 52.82, nasal 49.59, left orbital 87.70, and the external palatal is 130.20. Mean for three definitely sexed ASC male crania is: cranial 89.50, total facial 87.17, superofacial 55.08, nasal 47.77, left orbital 84.20, and the external palatal is 129.51; females are: cranial 90.76, total facial 85.54, superofacial 50.62, nasal 52.33, left orbital 92.83, and the external palatal 131.24.

It is apparent from this small comparison that differences do exist between the populations studies. Add this to the differences listed in the following chart, and differences become even more apparent.

	<u>CHART</u>	
	<u>ASC</u>	<u>HIBBEN</u>
Gonial Angle	Males 111.25°; Females 114.5°	80°
Pterion Form	H	K

^{11/} Frank C. Hibben, The Gallina Culture of North Central New Mexico; unpublished Doctor's dissertation (Department of Anthropology; Harvard University, Cambridge, 1939), Table B-II.

	<u>ASC</u>	<u>HIBBEN</u>
Orbit Shape	Rhomboid	Square
Inclination	Med. - Pro.	Small
Malars Anterior Projection	Medium	Small
Norma Verticalis	Sphenoid	Ovoid
Occipital Curvature	None-Slight	Yes
Metopism	None	Traces
Suture Construction	Med. - Complex	Simple
Mid-facial Prognathism	None-Slight	Small
Aveolar Prognathism	Slight	Medium
Total Prognathism	Slight	Medium
<u>NOSE</u>		
Nasal Profile	Concave	Concavo-Convex
Nasal Depression	Males-Med.; Females-Pro.	Small
Nasal Root Breadth	Pronounced	Medium
Nasal Bridge Breadth	Males-Med.; Females-Pro.	Medium
<u>BROW RIDGES</u>		
Form	Medium-Cont.	Medium
Degree	Medium	Small
Forehead Slope	Slight	Medium
Post Orbital Constriction	Medium	Small
Mastoid Process	Males-Pro.; Females-Med.	Medium ^{12/}

^{12/} Ibid, Cranial Observations and Table A-II

Other differences in other areas may be noted in the attached tables for a specific measurement, bone or index. Suffice it to state, as a rule, in this series, measurements and index values are generally smaller.

To this observer, it is apparent that different genetic populations simultaneously existed in the Gallina. Though they shared much of the same cultural milieu, they were different physically. Micro races existed in the Gallina.

Different cultural tendencies existed as evidenced by differences in burial techniques; i. e., Hibben's usually on the left side with the head pointed toward the west, whereas this series tend to be placed dorsally on a north-south axis with the face toward the west and east. Nogales burials were concentrated in a portion of the cliff house which suggests a cemetery while this series provides no indication of large numbers of individuals being interred together. However, this series did have multiple burials of children and adults. With the exception of Lange, no mention is made of individuals being buried in bins, yet this series had several. At no time was a person buried facing south in either series.

Also in this series is the lack of the complete person being interred. Often parts of the hands, feet or lumbar vertebrae are missing, although some mandibles are not present. At times, odd parts such as lumbar vertebrae, tarsals and carpels are found. No mention is made by Hibben of this. In both series, burials tend to be in the southern portion of the house, if in the house. The present series indicates a marked increase in fractures from the others. Hibben mentions only one individual, in a series of 38, who has a fracture of the skull while this series possesses three. Because of this and other evidence, it is stated that violence, of one form or another, was a way of life for the Gallina and that few persons reached old age, at least by our standards.

Age at death for all series follows with data on definitely sexed individuals and individuals whose age is known. Individuals designated "adult" are placed in the 20-30 age group; immature specimens are placed in the under 20 category. Approximately 70% of the population died by age 30 from all causes. Also apparent is that women once again outlive males.

	<u>MALES</u>	<u>FEMALES</u>	<u>TOTAL</u>	<u>% OF TOTAL (53)</u>
50+	1	3	4	7.55
40-50	4	2	6	11.32
30-40	3	2	5	9.43
20-30	4	3	24	45.28
Under 20	<u>-</u>	<u>1</u>	<u>14</u>	<u>25.42</u>
	12	11	53	100.00

Hibben stated that:

An attempt has been made to tie in the Gallina series with the morphological types as described by Hooten. Table D of the Gallina sequence indicates that the Gallina individuals closely approach in certain characteristics the "long faced European" and "plains" type next in order. Even in the original Pecos series, however, similarities between some of the types are very close. This taken into account with the summaries of Table C indicates a similarity with "large hybrid" and "long faced Europeans" type in the first place. The "large hybrid" type is especially favored in that four indices closely approximate the Gallina series.^{13/}

The referenced table is reproduced in the addendum of this report; however, it must be stated that some of Hibben's data is from corrected crania using a mean for the entire population. I have chosen to restrict mine to males, uncorrected, as Hooten did.

Cranial measurements for this series come closest to Hooten with totals as follows: Pseudo Alpine and Large-Hybrid, each five; Pseudo Negroid, four; Plains, Long-Faced Europeans and Residual, each two; Basketmaker and Pseudo Australoid, each one. At this point, there is a tie for closest approximation; consequently, I compared this series and Hooten's indices with the following results. Most similarities are with Hooten's Pseudo Alpine with three indices comparing favorably each of the others had one index comparing favorably. The final sequence, comparing to Hooten's morphological types to this series; Pseudo Alpine with a total of eight comparing characteristics; Pseudo Negroid with five, the Plains, Large-Hybrid, Residual and Long-Faced European next with three; the other at two each. Again, there are indications of differences in structure with Pseudo-Alpine favored here.

^{13/}Ibid, Chapter 23, p. 260

SUMMARY AND CONCLUSIONS

The cardinal directions of north and west hold special significance as not only are houses aligned in a north-south direction, but most burials have the head and trunk to the north with the face west. Perhaps the face is turned toward the land of the dead, or the direction one goes after death, or this is symbolic of going to the underworld. But whatever the direction of the trunk, the face is most often west.

Most intentional burials occur in bins in the house, if buried in the house. Those buried elsewhere are within 30 feet of the associated house structure and never south of a line drawn east-west through the rear of the house. Complete burials are flexed and are placed on one side or dorsally. Funerary offerings are present and consist of broken pottery concretions and seeds. Formal burials are of four types, a hollow crypt log-lined and stone-capped, filled burial with stone capstone, shallow grave filled and uncapped, and a filled bin, uncapped.

The dead are buried in the house with the living. An unusual trait, living with the dead. Also, the Gallina depart somewhat from the Southwestern trait of burying the dead in trash piles by placing burials in difficult soil, particularly in the floor of the house.

Partial burials occur in any part of the house with no definite organization. Complete interment is rare. In those interments which appear complete, there is always some part absent, most often parts of the hands and feet. Although at times, other parts are missing, notably tibias. In addition are the striations on the popliteal surface of femora and the proximal end of tibias. All of which suggests individual post mortum dismemberment. I suggest anthropophagy as a reason for dismemberment, perhaps the four articulated lumbar vertebrae are the remains of a ceremonial meal.

Violence and violent death was a way of life for the Gallina people. As attested to by numerous fractures of the skull, which could only have been made by an individual being hit, and two projectile points embedded in two males. Death from all causes was most pronounced in early years, notably before the age of 30.

Deficiencies are indicated by osteoporosis being present in most individuals examined. Pronounced bowing of several bones may be the result of osteomalacia. Arthritis is present, to some degree, in

most of the individuals examined. Metopism is not indicated. For most, the teeth are in good condition, with little crowding, few caries and complete eruption. Shovel-shaped incisors are present.

Ample evidence exists for separate, inbreeding, genetic populations in the Gallina. A comparison between the original Gallina series done by Hibben and this one is valid if for no other reason than location and numbers. Both are from the same geographical area, and data for Hibben's male crania was obtained on a frequency of 4-9 with long bone data frequency 2-5. The current series is based on a frequency of 3 for the male crania and up to 8 for the long bones.

It is recognized that at times both observers have mixed apples and oranges; i. e., in comparing means to means without separately considering males and females. However, this observer has attempted to supply information above what was needed to compare the two series and that which would make a more valid comparison. Upon comparison, it became clear that separate physical populations did exist in the Gallina. Some differences include, but are not limited to, skull shape, prognathism, orbit shape, pterion form, cranial indices, placement and number of parietal foramina and metopic traits. Perhaps the dichotomy is between those who lived at altitude and those who lived lower, thus precluding mixture.

There are distinct cultural differences as well including difference in burial technique, orientation of body, location and funerary offerings. In essence, there were people in the Gallina who shared some physical traits but not others; i. e., lambdoid flattening but not pterion forms and who shared some cultural traits but not others, i. e., multiple burial or singular ones. The population is not as homogenous as Hibben would have us believe.

Future investigators should look for burials in and within 30 feet of the house, particularly in bins, associated structures, and north of east-west line drawn through the rear of the house. Pay particular attention to femora and tibias, and exercise special care on the posterior surface of both proximal and distal end, noting striations. Particular attention must be paid to the skull in an effort to determine the presence of fractures of the frontal and lateral parietal regions.

A complete inventory must be kept to determine missing parts which are of peculiar interest. In conjunction with this attention must be paid to location and specifics of isolated portions of individuals found. Reconstructs must be made, particularly of the skull. Note all that comes out at the same level as the skeleton as these are probably funerary materials. Pay particular attention to worked bone.

The Gallina continues to present unanswered questions and mysteries for investigators. As a peripheral area, the Gallina will gain importance as work progresses; however, at present, the Gallina and its people remain an enigma.

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TABLES

NOTES PERTAINING TO INFORMATION CONTAINED IN TABLES

1. Individuals are listed, on specific tables, for which measurements could be taken or indices derived.
2. Data for Hibben is verbatim, extracted or derived from tables attached to his unpublished Doctor's paper which is referenced in the bibliography for this paper.
3. Data for Hooten is verbatim, extracted or derived from his "Indians of the Pecos" referenced in the bibliography of this paper.
4. Length is not provided for bones missing the diaphysis, metaphysis or broken.
5. Children were not considered in computing means.
6. Data is provided for reader information only.
7. All measurements were taken where possible.

	G-8	G-189	G-81A	G-81B	G-4	G-3-7	G-3-35	G-32P	G-2	G-80
HEIGHT	152.88	156.35	148.88	160.78	159.12	*	*	*	*	*
SEX	MALE	MALE	FEMALE	MALE	MALE	CHILD	CHILD	CHILD	ADULT	ADULT
AGE	454x	25+x	22+x	ADULT	32-35	949mo.	449mo.	9mo. 1/2 mo.	ADULT	ADULT
GONIAL ANGLE	111°	111.5°	111.5°	*	*	113.5°	*	122.5°	*	111°
PTERION FORM	L H	H	H	*	H	H	*	*	*	*
	R H	H	H	*	*	*	H	*	*	*
<u>DENTITION</u>										
WEAR	PRO.	MED.	SML.	*	PRO.	MED.	MED.	NONE	*	*
QUALITY	POOR	GOOD	GOOD	*	FAIR	GOOD	GOOD	GOOD	*	*
ACCESSORY CUSPS	?	NONE	NONE	*	?	NONE	FRES.	NONE	*	*
CARIES	?	3	NONE	*	NONE	NONE	NONE	NONE	*	*
ABCESSSES	NONE	NONE	NONE	*	NONE	NONE	NONE	NONE	*	*
PYORRHEA	PRO.	SML.	NONE	*	NONE	NONE	NONE	NONE	*	NONE
SHOVEL SHAPED INCISORS	UNK.	FRES.	FRES.	*	*	FRES.	*	*	*	*
CROWDING	NONE	MED.	SML.	*	PRO.	SML.	SML.	NONE	*	NONE
BITE	CORRECT	OVER	CORRECT	*	*	CORRECT	*	OVER	*	*
ERUPTION	INC. RUN3	COMP.	COMP.	*	COMP.	INC.	INC.	INC.	*	COMP.

G-3-35

G-3-2

G-31A

G-4

G-139

G-8

ORBITS	HIBBEN				
	SHAPE	RIGHT	LEFT	INCLINATION	MODE
INCLINATION	RIGHT	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
INCLINATION	LEFT	RHOM.	RHOM.	SLIGHT	SLIGHT
		PRO.	PRO.	SLIGHT	SLIGHT
MALARS	SIZE	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
LATERAL PROJECTION	ANTERIOR PROJECTION	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
ZYGO-MATIC PROCESS	NOSE	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
NASAL DEPRESSION	NASAL ROOT HEIGHT	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
NASAL FRIDGE HEIGHT	NASAL FRIDGE PREADTH	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
NASAL PROFILE	MID-FACIAL PROGNATHISM	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
ALVEOLAR PROGNATHISM	TOTAL PROGNATHISM	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
ALVEOLAR BORDER PRESERVATION	PALATE SHAPE	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
PALATE HEIGHT	DEFORMATION	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
BROW RIDGES -FORD	DEGREE	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
FOREHEAD SLOPE	POST ORBITAL CONSTRICTION	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND
GAELING	MASTOID PROCESS	RHOM.	RHOM.	ROUND	ROUND
		PRO.	PRO.	SLIGHT	ROUND

CRANIAL INDICES (UNCORRECTED)	G-8	G-189	G-4	G-81A	G-3-35	G-3-7	ASC-		Hibben Tot mean	ASC + Hibben	Hibben		Hibben Tot Ser. A(Def.)	Hooten mean
							Male	Mean			Male	Mean		
CRANIAL	96.12	88.73	93.64	90.57	76.43	*	89.5	87.27	88.44	-1.17	88.67	88.51	*	*
HEIGHT-LENGTH	78.13	61.04	86.44	83.05	*	*	82.29	82.54	*	*	*	*	*	*
HEIGHT-BREADTH	90.53	67.72	92.41	103.59	*	*	91.47	95.51	*	*	*	*	96.94	*
MEAN HEIGHT	83.83	*	89.27	92.06	*	*	86.55	88.39	*	*	*	*	*	*
FRONTOPIRIETAL (FRONTAL)	79.54	78.88	72.93	77.57	79.33	78.50	77.12	77.23	*	*	*	*	*	*
FRONTOSAGITTAL (FRONTAL CURVE)	87.63	85.51	88.06	89.55	84.73	94.28	87.06	87.69	*	*	*	*	*	*
FORAMEN MAGNUM	76.32	*	76.66	76.6	*	*	76.49	76.53	*	*	*	*	*	*
FACIAL	87.17	*	*	85.84	*	37.59	87.17	36.51	85.75	+7.6	86.25	86.7	85.96	*
SUPEROFACIAL	53.83	*	56.32	50.5	50.82	52.5	55.03	53.55	53.0	+1.55	53.93	51.02	52.09	*
ORBITAL -RIGHT	35.63	82.46	84.51	87.65	95.27	89.91	84.2	85.06	92.5	-7.44	94.91	91.74	*	*
LEFT	85.85	87.07	79.93	93.09	100.0	89.35	84.28	36.49	*	*	*	*	*	*
NASAL	46.99	48.95	47.38	53.34	62.5	52.04	47.77	49.17	45.8	+3.37	46.64	47.23	50.44	*
MAXILLOALVEOLAR (EXTERNAL PALATAL)	125.74	138.51	124.29	125.05	143.14	132.09	129.51	128.4	122.17	+6.23	120.35	119.71	119.16	*
PALATINE	96.92	96.67	*	99.5	83.98	91.34	96.8	97.7	*	*	*	*	*	*
GNATHIC	92.59	*	94.58	90.6	*	*	93.59	92.59	*	*	*	*	95.97	*
JUGOFRONTAL	68.87	*	69.74	67.18	82.9	76.76	69.31	68.6	*	*	*	*	*	*
CRANIOFACIAL TRANSVERSE	94.93	*	88.97	100.56	81.42	*	91.97	84.84	*	*	*	*	*	*
MANDIBULAR	85.4	*	*	*	*	*	35.4	35.4	*	*	*	*	*	*
THICKNESS OF THE MANDIBULAR BODY	40.61	48.04	*	41.57	*	*	44.33	43.41	*	*	*	*	*	*

NOTE: Data for Hibben lifted ver batum or extracted from his tables.

CRANIAL MEASUREMENTS	G-8	G-189	G-4	G-81A	G-3-35	G-3-7	ASC ADULT MALE MEAN	ASC FEMALE MEAN	ASC MEAN TOTAL	HIBBEN MEAN TOTAL	ASC HIBBEN TOTAL	HIBBEN MALE MEAN	HIBBEN FEMALE MEAN	HOOTENS TOT. DEFORMED SERIES A
HORIZONTAL CIRCUMFERENCE	487.1	504.2	501.5	481.5	*	*	497.6	481.5	493.58	489.29	14.29	504.0	496.0	495.29
ASION OPISTHION LENGTH	132.3	135.21	131.5	126.0	*	*	133.0	126.0	131.25	133.38	2.13	133.0	132.8	*
BASION NASION LENGTH	99.1	*	99.7	97.35	*	*	99.4	97.35	98.72	101.62	2.9	102.8	100.4	101.89
BASION PROSTHION LENGTH	92.1	*	94.3	88.2	*	*	93.2	88.2	91.53	95.0	3.47	95.6	95.6	97.8
NASION PROSTHION HEIGHT	72.0	75.65	75.7	68.25	44.4	57.4	74.75	68.25	73.13	72.5	.63	74.8	70.0	72.85
NASAL HEIGHT	25.9	25.15	25.5	20.9	32.0	42.5	24.52	20.9	26.2	24.6	1.6	25.4	24.66	25.8
NASAL BREADTH	25.3	27.0	25.35	27.15	20.0	22.5	25.88	27.15	26.2	24.6	.443	25.5	24.66	25.8
NASALIA UPPER BREADTH	17.32	15.4	14.99	13.9	11.5	10.8	15.9	13.9	15.4	14.96	.443	16.5	14.33	*
NASALIA LOWER BREADTH	19.2	18.8	17.1	13.9	13.3	17.2	18.37	18.9	18.5	15.75	2.75	17.0	16.0	*
INTERORBITAL BREADTH	23.3	25.1	23.2	21.4	19.2	17.2	23.87	21.4	23.25	24.08	.83	24.5	22.66	*
BIORBITAL BREADTH	96.9	101.8	102.1	97.01	78.7	84.8	100.27	97.01	90.45	97.23	3.17	96.66	98.4	*
ORBITAL HEIGHT RIGHT	33.7	34.15	33.65	36.4	30.2	31.0	33.83	36.4	30.43	35.79	1.42	36.5	36.0	34.8
ORBITAL BREATH RIGHT	39.4	39.2	42.1	39.1	30.2	34.5	40.23	39.1	39.45	37.83	2.12	37.5	39.0	39.9
ORBITAL HEIGHT LEFT	33.9	33.05	34.9	36.2	30.2	31.2	33.95	36.2	34.51	35.46	1.15	36.0	36.0	34.9
ORBITAL BREADTH LEFT	39.4	39.92	41.4	40.0	31.7	34.7	40.24	40.0	40.18	38.67	1.51	37.5	39.2	39.47
MIN. FRONTAL DIAMETER	93.8	99.5	93.8	90.8	81.0	82.5	95.7	90.8	94.48	93.38	1.10	94.0	93.6	94.88
BIZYGOMATIC DIAMETER	136.0	*	134.4	135.2	97.7	103.0	135.2	135.2	135.2	135.3	.10	137.0	134.66	138.56
BIGONULAR WIDTH	119.2	*	*	84.5	*	*	119.2	*	119.2	115.5	3.7	123.0	116.0	122.34
BIGONIAL WIDTH	86.4	*	*	84.5	*	*	86.4	84.5	85.45	97.0	11.55	96.66	97.33	101.56
PALATE EXTERNAL LENGTH	52.8	49.0	53.1	50.1	35.0	40.2	51.63	50.1	51.25	52.0	.75	53.6	53.2	55.04
PALATE EXTERNAL BREADTH	66.5	67.8	66.0	62.7	50.1	53.1	66.77	62.7	65.75	63.92	1.83	64.4	62.8	65.59
HEIGHT OF SYMPHYSIS	36.99	33.8	*	33.0	*	24.1	35.4	33.0	34.6	32.0	2.6	33.0	32.33	35.4
CONDYLO SYMPHYSICAL LENGTH	98.14	*	*	97.2	*	*	98.14	97.2	97.67	100.83	3.16	104.0	98.25	*
GLABELLO OCCIPITAL LENGTH	165.31	169.8	161.3	167.05	*	*	165.47	167.05	165.87	162.38	3.49	165.0	166.4	164.28
MAXIMUM WIDTH SKULL	142.1	150.7	151.0	134.6	120.0	126.0	147.9	134.6	144.6	142.1	2.5	144.5	147.2	145.43
ASION BREGMA HEIGHT	129.1	*	139.23	138.7	*	*	134.19	138.7	135.69	141.0	5.32	144.0	138.0	140.84
MAXIMUM FRONTAL WIDTH	120.5	126.2	128.6	116.95	102.1	105.1	125.1	116.95	123.06	*	*	*	*	*
MAX. FORAMEN MAG. WIDTH	26.1	*	26.0	24.91	*	*	26.05	24.91	25.67	*	*	*	*	*
BASION OPISTHION LENGTH	35.2	*	33.65	32.95	*	*	35.53	32.95	34.0	*	*	*	*	*
BREGMA FORION LENGTH	*	103.7	*	*	*	*	103.7	*	103.7	*	*	*	*	*
NASION BREGMA DISTANCE	100.5	103.5	102.15	100.25	93.2	95.6	102.05	100.25	101.6	*	*	*	*	*
NASION BREGMA CURVE	114.2	121.1	116.0	111.95	110.0	106.4	117.1	111.95	115.81	*	*	*	*	*
PALATE INTERNAL BREADTH	40.4	40.65	*	40.4	27.8	30.6	40.53	40.4	40.48	*	*	*	*	*
PALATE INTERNAL LENGTH	42.3	41.21	*	40.65	33.1	33.5	41.78	40.65	41.32	*	*	*	*	*
NASION MENTON HEIGHT	118.2	117.1	*	116.23	*	91.6	117.9	116.23	117.28	117.28	0	118.5	117.33	119.38

NOTE: Data for Hibben lifted ver batum or extracted from his tables.

	G-8		G-139	G-4	G81A	G81B	G-3-7	ASC ADULT MEAN	HIBBEN ADULT MEAN
AGE	45+ x	25-28	32-35	22	ADULT	9yr-9mo.			
SEX	MALE	MALE	MALE	FEWMALE	MALE	CHILD			
RIGHT SCAPULA									
GLENOID SHAPE	oval	oval	*	*	*	*	*	*	*
GLENOID LIPPING	MED.	SLIGHT	*	*	*	*	*	*	*
TOT. HEIGHT	140.5	139.4	*	*	*	*	139.95	144.5	
INF. HEIGHT	101.9	*	*	*	*	*	101.9	113.4	
BREADTH	95.7	*	*	*	*	*	95.7	100.0	
TOTAL INDEX	68.11	*	*	*	*	*	68.11	69.7	
INFERIOR INDEX	106.47	*	*	*	*	*	106.47	38.32	
LEFT SCAPULA									
GLENOID SHAPE	oval	oval	*	*	*	oval	*	*	*
GLENOID LIPPING	MED.	SLIGHT	*	*	*	*	*	*	*
TOT. HEIGHT	142.1	*	*	*	*	*	142.1	150.4	
INF. HEIGHT	104.8	*	*	*	*	*	104.8	113.67	
BREADTH	96.0	*	*	*	*	*	96.0	98.0	
TOTAL INDEX	67.56	*	*	*	*	*	67.56	66.22	
INFERIOR INDEX	104.05	*	*	*	*	*	104.05	86.26	
RIGHT CLAVICLE									
MAX. LENGTH	141.5	141.7	*	*	*	100.6	141.6	142.0	
LEFT CLAVICLE									
MAX. LENGTH	141.7	BRKN.	*	*	*	*	141.7	144.33	
RIGHT FEMUR									
BEWING	SLIGHT	SLIGHT	SLIGHT	*	*	SLIGHT	403.8	404.43	
BICONDYLAR LENGTH	405.9	393.7	411.8	*	*	273.1	405.87	407.57	
NAX. LENGTH	403.1	395.3	414.2	*	*	273.6	44.23	42.91	
NAX. HEAD DIA.	42.4	42.99	47.3	*	*	25.0	26.1	26.1	
SUBTROCANTER ANT-POST	25.6	24.3	28.6	*	*	16.99	26.2	27.8	
SUBTROCANTER LATERAL	23.3	27.1	28.2	*	*	19.5	100.32	94.18	
PLATYMERIC INDEX	109.87	89.67	101.42	*	*	87.13	26.07	27.44	
MIDDLE ANT-POST	26.2	24.4	27.6	*	*	16.7	23.23	24.78	
MIDDLE LATERAL	22.6	21.0	26.1	*	*	15.4	112.62	90.56	
PILASPIC INDEX	115.93	116.19	105.75	*	*	198.44			

	G-3	G-189	G-4	G-81A	G-81B	G-3-7	ASC ADULT MEAN	HIBBEN ADULT MEAN
<u>LEFT FEMUR</u>								
BOVING								
BICONDYLAR LENGTH	SLIGHT	SLIGHT	*	*	PRO.	SLIGHT	401.33	405.2
MAX. LENGTH	406.1	394.9	*	*	402.99	273.2	404.33	407.17
MAX. HEAD DIA	409.2	399.3	*	*	405.5	274.1	42.4	43.17
	42.5	43.7	*	*	41.0	27.9	26.5	26.55
SUBTROCANTER ANT-POST	26.1	27.0	*	*	26.4	17.1	26.1	27.44
SUBTROCANTER LATERAL	27.5	24.8	*	*	26.1	19.2	101.65	97.21
PLATYMERIC INDEX	94.91	108.87	*	*	101.16	89.06	24.53	28.0
MIDDLE ANT-POST	25.6	23.4	*	*	24.6	17.9	22.83	24.78
MIDDLE LATERAL	25.3	21.2	*	*	22.0	15.1	107.79	88.96
FILAESTRIC INDEX	101.19	110.38	*	*	111.82	113.54		
<u>RIGHT TIBIA</u>								
MAX. LENGTH	339.6	336.2	342.1	311.9	347.2	*	335.4	342.2
MIDDLE ANT-POST	31.1	28.2	29.6	25.3	30.2	*	26.88	28.29
MIDDLE LATERAL	22.1	17.5	22.7	17.8	16.9	*	19.4	21.0
NUTRIENT FORAMEN ANT- POST	33.2	31.7	33.7	30.9	32.8	*	32.46	32.13
NUTRIENT FORAMEN LATERAL	22.2	19.7	24.6	20.1	17.9	*	20.9	21.88
MIDDLE INDEX	71.06	62.06	76.69	57.61	55.96	*	64.67	74.47
CNEMIC INDEX	66.87	62.15	72.997	65.05	54.57	*	64.32	68.19
<u>LEFT TIBIA</u>								
MAX. LENGTH	336.4	336.8	*	314.7	344.4	*	333.08	342.4
MIDDLE ANT-POST	29.8	28.8	*	29.3	30.1	*	29.5	29.0
MIDDLE LATERAL	20.9	17.3	*	18.2	16.3	*	18.18	20.83
NUTRIENT FORAMEN ANT- POST	32.2	29.8	*	33.2	33.25	*	32.11	31.85
NUTRIENT FORAMEN LATERAL	23.1	19.2	*	19.8	17.4	*	19.98	22.14
MIDDLE INDEX	70.13	60.07	*	62.12	54.15	*	61.62	72.03
CNEMIC INDEX	71.94	64.43	*	59.64	52.33	*	62.03	69.63
<u>RIGHT FIBULA</u>								
MAX. LENGTH	332.4	323.1	*	303.9	337.2	*	324.15	336.0
<u>LEFT FIBULA</u>								
MAX. LENGTH	337.8	*	*	*	335.4	*	336.6	334.67

TIBIA-FEMORAL INDEX	RIGHT	LEFT	G-8	G-189	G-4	G-81A	G-81B	ASC ADULT MEAN	HIBBEN ADULT MEAN
	93.21	85.05	82.59	*	*	*	*	83.62	84.02
	82.41	84.35	*		*		84.03	83.9	84.44
RIGHT INNOMINATE	IX	V	*		*		*		
PHASE OF SYMPHASIS	N&D	N&D	*		*		*		
ISCHIATIC NOTCH	194.0	194.2	*		*		*	194.1	200.3
INNOMINATE HEIGHT	55.5	54.3	*		*		*	54.9	*
MINIMUM BREADTH	149.2	142.2	*		*		*	145.05	150.5
MAXIMUM BREADTH	77.16	73.22	*		*		*	75.19	73.04
INDEX									
LEFT INNOMINATE	IX	*	*		III		*		
PHASE OF SYMPHASIS	N&D	N&D	*		N&S		*		
ISCHIATIC NOTCH	109.1	101.8	*		192.1		*	104.33	108.8
INNOMINATE HEIGHT	55.8	56.2	*		50.3		*	54.1	*
MINIMUM BREADTH	151.2	*	*		130.6		*	145.4	149.0
MAXIMUM BREADTH	75.94	*	*		72.67		*	74.31	74.89
INDEX									
WHOLE PELVIS									
SUBPUBIC ANGLE	MED.	MED.	*		PFO.		*		
PERIN SHAPE	HEART	HEART	*		*		*		
BI-ILIAC BREADTH	265.01	240.2	*		*		*	252.61	264.0
PELVIC INLET INDEX	83.29	82.44	*		*		*	82.86	
TOTAL PELVIC INDEX	74.17	80.34	*		*		*	77.26	76.55
SACRUM									
SEGMENTS	5	5	*		*		*	5	
SACRAL CURVE	MED.	L&D.	*		*		*		
CURVE BEGINS	3	3	*		*		*		
SPINAL CLOSURE BEGINS	4	4	*		*		*		
ARTHRIC CHANGES	SLIGHT	NONE	*		*		*		
HEIGHT	105.0	92.0	*		*		*	98.5	107.33
BREADTH	110.4	104.9	*		*		*	108.15	114.2
INDEX	105.14	115.13	*		*		*	110.13	108.46
ANTERIOR LENGTH	105.0	91.9	*		*		*	98.45	*
ANT. CURVE LENGTH	107.0	100.5	*		*		*	103.75	*
LUMBAR									
ANT. CENTRAL HEIGHT	126.5	*	*		*		*	126.5	128.33
POST. CENTRAL HEIGHT	129.9	*	*		*		*	129.9	134.0
CUNNINGHAM INDEX	102.69	*	*		*		*	102.69	104.58

	G-8	G-120	G-4	G-81A	G-81P	G-3-7	ASC ADULT LEAN	HIBBEN ADULT LEAN
RIGHT HUMERUS								
PERFORATION OF	NO	NO	*	*	*	YES	*	*
OLECRANON FOSSA								
MAX. LENGTH	288.4	286.8	*	*	*	102.7	287.6	299.55
MIN. MIDDLE	20.1	20.6	*	*	*	13.8	20.35	21.66
MAX. MIDDLE	14.9	14.1	*	*	*	10.1	14.5	14.92
MAX. HEAD DIA.	44.1	41.1	*	*	*	*	42.6	42.25
MIDDLE INDEX	74.13	93.19	*	*	*	73.19	83.66	69.03
HUMERO-FEMORAL INDEX	70.67	72.55	*	*	*	70.43	71.61	74.33
LEFT HUMERUS								
PERFORATION OF	no	yes	*	yes	*	yes	*	*
OLECRANON FOSSA								
MAX. LENGTH	279.3	285.7	*	*	*	193.3	282.5	309.2
MIN. MIDDLE	18.6	19.1	*	17.99	*	13.8	18.56	21.5
MAX. MIDDLE	13.9	13.8	*	12.8	*	10.1	13.5	14.13
MAX. HEAD DIA.	42.1	39.4	*	*	*	24.1	40.75	41.33
MIDDLE INDEX	74.73	84.7	*	71.15	*	73.19	76.36	66.06
HUMERO-FEMORAL INDEX	68.42	71.55	*	*	*	70.52	69.99	73.24
RIGHT RADIUS								
BOWING	SLIGHT	MED.	*	*	*	MED.	*	*
MAX. LENGTH	231.2	217.1	*	*	*	145.0	224.15	230.67
HUMERO-RADIUS INDEX	80.17	76.52	*	*	*	75.25	78.34	77.28
LEFT RADIUS								
BOWING	MED.	MED.	*	*	*	MED.	*	*
MAX. LENGTH	230.2	221.1	*	*	*	145.0	225.65	233.2
HUMERO-FEMORAL INDEX	82.42	75.28	*	*	*	75.01	79.85	77.66
RIGHT ULNA								
MAX. LENGTH	249.1	BRKN.	*	*	*	161.1	249.1	247.78
LEFT ULNA								
MAX. LENGTH	250.5	231.9	*	*	*	172.2	241.2	250.25

PECOS MEANS FOR DEFORMED CRANIA

INDEX	MALE MEAN	BASKET MAKER	PSEUDO- NEGROID	PSEUDO- AUSTRALOID	PLAINS INDIANS	LONG-FACED EUROPEANS	PSEUDO ALPINE	LARGE HYBRIDS	RESIDUAL
CRANIAL	89.5	80.5	84.0	80.0	33.0	82.83	92.14	<u>89.83</u>	90.92
HEIGHT-LENGTH	82.29	78.5	<u>81.38</u>	80.25	81.6	84.25	85.64	97.9	87.55
HEIGHT-BREADTH	91.47	98.0	97.62	99.25	98.64	101.88	<u>92.73</u>	97.86	96.64
CRANIAL MODULE	149.18	150.67	146.75	151.5	150.07	150.62	149.8	152.48	<u>149.45</u>
TOTAL FACIAL	87.17	90.2	88.67	85.25	<u>92.14</u>	90.0	81.9	85.39	85.33
SUPEROFACIAL	55.08	<u>55.0</u>	54.25	51.14	53.87	56.17	49.45	51.8	52.44
LEFT ORBITAL	84.2	90.43	88.08	<u>93.73</u>	87.87	89.06	87.14	87.07	87.09
NASAL	47.77	50.75	53.77	53.27	49.05	<u>46.78</u>	51.93	50.04	51.25
GNATHIC	93.59	97.14	100.4	95.62	95.05	92.5	<u>94.5</u>	96.19	96.89
MAXILLOALVEOLAR	129.51	122.0	112.45	118.44	120.0	119.13	<u>122.36</u>	118.29	116.88

*Figures underlined in these columns indicate closest approximations to this series means.

INDICES	G-8	G-189	G81A	G81B	G-4
SACRUM					
LENGTH - BREADTH	105.14	115.13	*	*	*
CURVATURE	98.56	91.34	*	*	*
PELVES					
ISCHIUM-PUBIS	95.67	82.37	85.3	*	*
PELVIC BREADTH HEIGHT	74.71	80.55	*	*	*
PELVIC INDEX	83.29	82.44	*	*	*
FEMUR					
PLATNERIC RIGHT	109.87	89.67	*	*	101.42
LEFT	94.91	108.87	*	101.15	*
PILASTRIC RIGHT	115.93	116.19	*	*	105.74
LEFT	101.18	110.38	*	111.82	*
TIBIA					
CNEMIC RIGHT	66.87	62.15	65.05	54.57	72.99
LEFT	71.94	64.43	59.82	52.33	*
SCAPULA					
SCAPULAR TOTAL RIGHT	68.13	*	*	*	*
LEFT	67.56	*	*	*	*
INFRASPINOUS RIGHT	106.47	*	*	*	*
LEFT	104.05	*	*	*	*
SUPRASPINOUS RIGHT	*	*	*	*	*
LEFT	48.94	*	*	*	*
BRACHIAL RIGHT	*	76.43	*	*	*
LEFT	80.42	75.28	*	*	*
CURAL RIGHT	83.21	85.05	*	*	82.59
LEFT	82.41	84.34	*	84.93	*
INTERMEMBRAL	70.24	63.69	*	*	*
VEPTERRAE					
ATLAS / BODY	50.26	*	*	*	*
VERTEBRAL FORAMEN	94.12	*	*	*	*
BONDOINS SEXUAL	67.53	*	*	*	*

PECOS MEANS

	ASC MALE MEAN*	HIBBEN ADULT MEAN	LONG FACED EUROPEAN	PSEUDO ALPINE	RESIDUAL	LARGE HYBRID	PLAIN MAKER	BASKET MAKER	PSEUDO NEGROID	PSEUDO AUSTRALOID	ASC TOT. MEAN	HIBBEN MALE MEAN
HORIZONTAL CIRCUMFERENCE	497.6	489.29	500.41	492.64	487.14	498.60*	494.27	500.00	492.03	499.09	493.58	504.0
NASION OPISTHION LENGTH	133.0	133.38	103.60	100.80	99.67*	102.48	103.58	100.86	101.10	102.00	131.25	133.0
NASION NASION LENGTH	90.4	101.62	95.80	95.40*	96.56	93.62	98.53	98.29	100.40	97.62	98.72	102.8
NASION PROSTHION LENGTH	93.2	95.0	76.67	69.75	72.75	74.46*	75.74	73.25	72.23	70.67	91.53	95.6
NASION PROSTHION HEIGHT	74.75	72.5	123.31	115.00	118.30*	121.54	121.35	121.17	118.31	117.20	73.13	74.8
NASION MENTON HEIGHT	117.8	117.28	52.39	49.57	51.04	51.87	52.14*	51.38	43.21	49.18	117.28	118.5
NASAL HEIGHT	54.52	51.5	24.53	25.68	26.00	25.94*	26.07	26.12	26.38	26.18	53.61	53.4
NASAL BREADTH	25.88	24.6									26.2	25.5
NASALIA UPPER BREADTH	15.9	14.96									15.4	16.5
NASALIA LOWER BREADTH	18.37	15.75									18.5	17.0
INTERORBITAL BREADTH	23.87	24.08									23.25	24.5
BIORBITAL BREADTH	100.27	96.28									99.45	96.66
ORBITAL HEIGHT RIGHT	33.83	35.39	25.64	35.27	34.31*	35.57	35.56	35.43	34.46	32.85	34.48	36.5
ORBITAL BREADTH RIGHT	40.23	37.83	40.14*	40.69	39.46	41.07	40.52	39.57	39.65	39.55	39.95	37.5
ORBITAL HEIGHT LEFT	33.95	35.66	35.53	35.12	34.70	35.13	35.20	35.25	34.58*	33.14	34.51	36.0
ORBITAL BREADTH LEFT	40.24	38.67	39.97	39.42	39.25	40.02*	39.96	38.91	39.12	39.45	40.13	37.5
MIN. FRONTAL DIAMETER	95.7	93.38	97.00	94.50*	94.29	97.62	93.65	93.00	95.46	94.09	94.48	94.0
BIZYGOMATIC DIAMETER	135.2	135.3	137.00	138.92	137.50	142.65	139.32	132.71	133.83*	137.67	135.2	137.0
BICONDYLAR WIDTH	119.2	115.5	119.17*	121.89	123.33	125.85	124.60	116.80	115.78	120.17	119.2	123.0
BIGONIAL WIDTH	86.4	97.0	101.58	100.02	107.25	105.22	104.25	95.40*	98.60	100.00	85.45	96.66
PALATE EXTERNAL LENGTH	51.63	52.0	55.27	53.97*	55.25	56.41	55.87	55.17	57.63	54.25	51.25	53.6
PALATE EXTERNAL BREADTH	66.77	63.92	65.60	65.82	64.56	66.81*	67.00	67.33	64.82	64.12	65.75	64.4
HEIGHT OF SYMPHYSIS	35.4	32.0	36.07	33.65	36.72	36.07	35.15*	36.00	36.33	35.68	34.6	33.0
CONDYLO SYNPHYSICAL LENGTH	98.14	100.83	104.85	102.60*	103.29	106.11	105.54	103.75	106.00	104.67	97.67	104.0
GLABELLO OCCIPITAL LENGTH	165.47	162.33	171.00	161.21	150.57	164.38	170.62	174.50	165.60*	174.75	165.87	165.0
MAXIMUM WIDTH SKULL	147.9	142.1	141.42	148.07*	145.85	149.02	140.80	140.50	139.80	139.50	144.6	144.5
NASION BREGMA HEIGHT	134.18	141.0	142.62	138.50	141.00	144.57	139.20	137.00	134.88*	140.25	135.63	144.0

- NOTES: 1. Those annotated by an asterisk are those that most closely approximate this series adult male means.
2. Figures underlined in these columns indicate closest approximations to the total Gallina means of Hibben.
3. The above figures are Hootens somatological data for uncorrected or deformed males. Consequently ASC has elected to compare only male, uncorrected data with Hootens. Hibben chose to compare the mean for his total series against Hootens males. However the ASC total mean and Hibbens male means are included to enable the reader to make their own comparisons.
4. The above data for Hibben was extracted from his Table D-I in which he lists and underlines as shown.

PARTIAL REPRODUCTION OF HIBBENS TABLE D -II -

	PECOS MEANS *									
	HIBBENS GALLINA ADULT MEAN	LONG FACED EUROPEAN	PSEUDO ALPINE	RESIDUAL	LARGE HYBRID	FLAINS	BASKET MAKER	FSEUDO NEGROID	FSEUDO AUSTRALOID	
CRANIAL INDEX (UNCORRECTED)	88.44	82.83	94.14	90.92	89.83	83.0	80.5	84.0	80.0	
CRANIAL INDEX (CORRECTED)	83.0	79.83			<u>85.4</u>	78.52	77.35	77.18	74.74	
HEIGHT-LENGTH (CORRECTED)	77.88	78.41			79.77	78.29	81.14	73.3	78.77	
HEIGHT-BREADTH (CORRECTED)	91.38	97.87			<u>92.88</u>	<u>99.28</u>	105.18	95.56	105.22	
FRONTO-PARIETAL (CORRECTED)	64.17									
AURICULAR HEIGHT-LENGTH (CORRECTED)	70.38									
TOTAL FACIAL	85.75	90.0	81.9	85.33	85.39	87.14	90.2	88.67	85.25	
UPPER FACIAL	53.0	56.17	49.45	<u>52.44</u>	51.8	53.87	55.0	54.25	51.14	
CRANIO-FACIAL (CORRECTED)	97.9									
NASAL	45.8	46.78	51.93	51.25	50.04	49.05	50.75	53.77	53.27	
NASALIA-TRANSVERSE	89.0									
LEFT ORBITAL	92.5	89.06	87.14	87.09	87.07	87.87	<u>90.43</u>	88.08	83.73	
INTERORBITAL	24.11									
ZYGO-GONIAL	72.25									
FRONTO-GONIAL	100.25									
ZYGO-FRONTAL	70.0									
EXTERNAL PALATAL	122.17	119.13	122.36	116.88	118.29	120.0	<u>122.0</u>	112.45	118.44	
MEAN DIAMETER FORAMEN MAGNUM	30.0	31.81	<u>30.6</u>	31.57	31.65	31.65	32.0	29.35	30.72	
CRANIAL MODULE	147.39	150.62	<u>149.8</u>	149.45	152.48	150.07	150.67	<u>146.75</u>	151.5	

*Figures underlined in these columns indicate closest approximations to Hibbens Gallina means.

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